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FACTORS ASSOCIATED WITH CONDOM USE AND HIV RISK PERCEPTION IN HETEROSEXUAL MALES IN BELIZE

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Abstract of the Dissertation

Factors Associated with Condom Use and HIV Risk Perception in Heterosexual Males in Belize

By

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The Caribbean region has the highest regional adult HIV prevalence second only to sub-Saharan Africa (UNAIDS, 2007) with an average 5% prevalence in the adult population. Since the first diagnosed seropositive case in Belize in 1986 there has been a significant increase, with more than 2% prevalence in the adult population. Heterosexual transmission is the primary mode of HIV transmission in Caribbean and Latin American countries, including Belize. While sex between men is a recognized factor in the heterosexual transmission, the heterosexual adult male has been a neglected population subgroup that is at risk for HIV infection. This epidemiologic study of heterosexual Belizean males focused on behavior and attitudes that contributed to risks associated with condom use and HIV risk perceptions.

Measures of benevolent machismo attitude, as a construct of gender and power theory, were included. The Health Belief Model also informed the analyses. The study design was a quantitative, secondary data analysis of a Belizean dataset. There were two outcome variables. A number of independent variables were grouped into three categories: bio-psychosocial, attitudinal and behavioral. Factor analysis confirmed the fit for two non-validated independent index measures constructed for this study: Benevolent Machismo Attitude Index (BMAI) and HIV Awareness Index (HAI).

Descriptive analyses provided preliminary results for independent variables statistically significant with condom use and statistically significant with perceived HIV risk. Logistic regression was used to determine predictors of condom use and perceived HIV risk. Findings confirmed previous research that

younger age and having multiple partners were predictors of condom use. Having knowledge of how HIV was transmitted and having multiple partners were associated with perception of HIV risk.

The BMAI was neither a predictor of condom use nor a predictor of perceived of HIV risk. The results of this study of heterosexual men in Belize concurs with factors associated with condom use and perceived HIV risk as established in studies done in other countries and cultures.

DEDICATION

This dissertation is dedicated to my family. Without the unwavering support, encouragement and sacrifice of my life partner, Emerson, this achievement would not have been possible. You helped me to persevere especially during those times when I was at my lowest.

Jarrod, my son, was prideful even as he expressed it with wry humor. As I focused on my dissertation I watched you grow into a wonderful human being. I am forever grateful and proud of the man you have become.

The pragmatic wisdom of my sister, Sharrette, was especially helpful. To my parents, who both passed away during this dissertation process, I am thankful. My mother, Rita, was an inspiration throughout my life. She continues to be one of my many angels.

Lastly, this dissertation is dedicated to Ginger Burn and Ray Hubbe.

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CHAPTER I INTRODUCTION

HIV Worldwide

The Human Immunodeficiency Virus (HIV) is a virus that attacks and takes over a cell's genetic material, reproduces and kills cells that are the body's main defense against illness. HIV Disease, including HIV infection and all stages of the conditions resulting from HIV infection, is synonymously used with the term Acquired Immune Deficiency Syndrome (AIDS) (Stop AIDS Project, n.d). Virtually unknown some 26 years ago, today over 33 million people worldwide are living with HIV (Joint United Nations Programme on AIDS [UNAIDS], 2007). About one in 120 persons worldwide (≈0.8%) is believed to be HIV positive.

In its 2004 global report, UNAIDS acknowledged AIDS as the fourth leading cause of death in the world claiming the lives of at least 18 million through the end of 2004. According to UNAIDS, HIV/AIDS continued to be a widespread public health challenge in 2007 and listed it among the leading causes of deaths worldwide. Everyday almost 7,000 persons become infected with HIV and over 5,500 persons die from AIDS (UNAIDS, 2007). Transmission of HIV occurs through unprotected vaginal or anal sexual contact, from contaminated needles, blood products or transplanted organs, or from an infected mother to her baby during birth or from her breast milk.

The estimation of how long a person will survive from HIV infection to death, if they don't receive antiretroviral treatment, has increased from 9 years to 11 years (UNAIDS, 2006). This decrease in death rates is due, in part, to an improved methodology for estimation modeling that lowered the adult prevalence rates in several countries, including India and Sub-Saharan Africa. The result of new information has improved estimates of the number of new HIV infections, number of people living with HIV, and AIDS mortality. Published reports for 2007 have lower estimates compared with estimates reported in previous years. UNAIDS (2007) cautioned against comparison of statistics between 2007 and previous years given that the estimation models utilized in 2007 were significantly different from those used in previous years. Nonetheless, in the last two and one-half decades there has been a slow but sure expansion of the HIV/AIDS epidemic to just about every community in all parts of the world (Kaiser Family Foundation, n.d.).

HIV/AIDS in the Caribbean and Latin America

The HIV/AIDS epidemic is spreading in the Caribbean, particularly among young adults between 15-24 years (UNAIDS, 2007). A 2007 adult HIV prevalence estimated at 1.0% makes it the region with the second highest adult prevalence worldwide after Sub-Saharan Africa. Estimates of those newly infected with the virus numbered 17,000 and those who died from AIDS numbered 11,000. The island of Hispañola (Dominican Republic and Haiti) accounted for close to three quarters of the 230,000 people living with HIV in the Caribbean. A key factor in the epidemic is commercial sex, i.e. unprotected sex between sex workers and clients. Studies found

HIV prevalence among sex workers to be 3.5% in the Dominican Republic, 9% in Jamaica and 31% in Guyana (Pan American Health Organization, 2007; Allen et al., 2006).

The efforts of the Caribbean Community (CARICOM), an association of English speaking Caribbean states, provided much needed political leadership and a profile as change agent. CARICOM countries are small with great diversity, multiple differences, and a recognized common problem of resource limitations. They attempted to unite to effect change to stem the potentially far reaching negative impact of the HIV/AIDS epidemic on health and economy of the Caribbean.

CARICOM countries co-sponsored a multi-sectoral consultative meeting on HIV/AIDS in the Caribbean in 1998. The formation of a regional task force and the development of a HIV/AIDS strategic plan of action for regional direction are two examples that underscore the CARICOM efforts following their 1998 meeting. The UN General Assembly Special Session on HIV/AIDS (UNGASS) supported this process when, in June 2001, it provided high-level political commitment for AIDS in the Caribbean. CARICOM was able to enter the global discussion and focus international attention on the situation and unique response needs of the Caribbean HIV/AIDS epidemic (UNAIDS, 2004). While political commitment appeared to be in place in the region, poverty and a lack of resources were usually key impediments to progress in the responses defined.

The HIV/AIDS epidemic in the Caribbean and Latin America can be described as 'generally stable', with HIV transmission among specific populations, such as sex workers and men who have sex with men (MSM), at higher risk of exposure. UNAIDS (2007) estimated the number of new HIV infections in Latin America in 2007 at 100,000, bringing the total number to 1.6 million people living with HIV in this region. An estimated one-third of all HIV positive persons in Latin America live in Brazil. AIDS deaths in Latin America in 2007 were estimated to be 58,000.

Much of the HIV transmission has been attributed to unsafe paid sex and unprotected sex between men (Voelker, 2001). Heterosexual transmission has been established as the primary mode of HIV transmission in Caribbean and Latin American countries (Cohen, 2006; Prata & Fraser, 2005). However, sex between men is an important factor in the heterosexual transmission by men who have partners of both sexes. High HIV prevalence among MSM has been found in several Central American countries including Panama, Costa Rica, Nicaragua, El Salvador, Guatemala and Belize (UNAIDS, 2007).

HIV/AIDS in Belize

Belize, in spite of its British legacy and membership within CARICOM, exhibits many of the cultural and social traditions of its geographic neighbors in Central America or Mexico. Socio-politically situated in the Caribbean, Belize is nevertheless included in the Latin American HIV/AIDS epidemic panorama. Each Central American country, except Belize, has a population size of 3 million or more. Belize's small population is estimated at 311,480 (Statistical Institute of Belize, 2007).

The Belize National AIDS Commission [NAC], 2008 report indicated that the primary mode of transmission of HIV infection was heterosexual. As in the Caribbean

and Latin America, sexual practices of commercial sex workers and men having sex with other men are issues that are keys to the HIV/AIDS epidemic in Belize. There is difficulty addressing the needs of these two high risk populations given that the sexual practice for both groups is criminalized, based on legislation in Belize.

Criminalization contributes to the legal and social stigma attached to MSM. Likely to be linked to inaccurate data reporting, stigma makes it more difficult to ascertain the true size of this group. Men who have sexual partners with both sexes are not likely to disclose this practice for fear of social and economic injustice as well as for the legal ramifications. The impact is on both HIV morbidity and AIDS mortality. Caceres (2002) found that infection levels among men who had same sex partners ranged from 7 times higher in Honduras to 38 times higher in Nicaragua than in each respective country's adult general population.

Belize is the only one among Mexico and Central American countries with an HIV prevalence in the general population above two percent (UNAIDS, 2001c; UNAIDS, 2005; UNAIDS, 2007). The first diagnosis of HIV in Belize occurred in 1986 (National AIDS Task Force, 1999; National AIDS Commission , 2008). Subsequently the increase in cases has been steady and significant, with UNAIDS reporting a prevalence of 2.4% in the adult population by the end of 2005. The highest percent (62.4%) of AIDS cases, and the highest percent (69.4%) of AIDS related deaths (NAC, 2006) are from people living in the administrative district of Belize.

While AIDS related mortality rose from the fourth leading cause of death for all age groups in Belize in 2003 to the third leading cause in 2004, it was the leading cause of death for those 30 to 49 years of age in both years (NAC, 2005). The Central Medical Laboratory data revealed a prevalence of 3.4% among those who tested for HIV in Belize in the first half of 2005 (NAC, 2006). A baseline seropositive study conducted in 2005 among Belize's inmate population found an overall HIV prevalence of 4.9% (NAC, 2006).

Improved UNAIDS estimations of HIV prevalence in the adult population is responsible, in part, for an adjustment lowering the Belize adult HIV prevalence to 2.1% (UNAIDS, 2007). Weaknesses in Belize's monitoring and evaluation systems continue to make it difficult to properly report the impact of the prevention, treatment and support services. However, a number of steps have been made and others are ongoing to reduce and remove obstacles to successful execution of the HIV/AIDS national response (NAC, 2008). Among these steps were studies to establish baseline data.

Studies addressing knowledge, attitudes and practices began in 2002 among high-risk populations in Belize. One study found that 26.1% of respondents between 15 to 24 years of age correctly identified HIV transmission prevention methods and major HIV misconceptions. Almost 20% of respondents in this same study reported having their first sexual experience before the age of 15 and 8.3% reported having multiple sexual partners in the last 12 months (NAC, 2008). A similar KAP study found that 28% of inmates of the Belize Central Prison correctly identified HIV transmission prevention methods and major HIV misconceptions.

A study of youths in six Belize City schools found 34.6% reporting being sexually active (Kinsler, Sneed & Morisky, 2003). Forty-eight percent of those youths were 13 to 14 years of age at first intercourse. Another study in three urban locations

among youths 10 to 24 years of age, in school and out of school, found that 41% of respondents were sexually experienced. Among these youths, 78.4% had their first sexual intercourse experience before the age of 15 years. Only 62% reported condom use at their last sexual intercourse (NAC, 2006).

Belize took a number of steps to stem the increase of HIV infection and deaths from AIDS. Among these steps was the guaranteed screening through the Ministry of Health of all blood units used in transfusion since 1987 (Government of Belize, 2001). A national AIDS commission, created in 2000, was legitimized by a national law passed in 2004. An HIV testing program to prevent transmission from mother to child was established for pregnant women countrywide in 2000. Voluntary counseling and testing centers were opened to the general population in each of the six administrative districts (NAC, 2008). At the end of 2007 a government sponsored antiretroviral therapy program was providing services in the national health system to about 15% of persons living with HIV/AIDS (NAC, 2008). In 2005, a national policy on HIV/AIDS in the workplace was passed and a national strategic response plan was developed. A health and family education policy was adopted in 2006.

HIV/AIDS Impact

Belize and other countries in Latin America and the Caribbean continue to be both witnesses to and casualties of the ravages of HIV/AIDS. The threat of increased infection is growing especially among disadvantaged, migrant (Parrado, Flippen, & McQuiston, 2005) and other vulnerable populations. HIV/AIDS has had a devastating impact on families and has highlighted the vulnerability of women in particular. The epidemic threatens the future of sustainable development, affecting heterosexual males in their productive years. In the second decade of the history of the HIV/AIDS epidemic there was a shift in populations affected (Harper, 2007; Myers, Javanakht, Martinez, & Obediah, 2003; UNAIDS, 2000b) towards heterosexuals in general (Campbell, 1995), and women in particular (Soler et al., 2000; St. Lawrence et al., 1998; Wingwood & DiClemente, 1998). There has been a slow and steady change in the research focus that acknowledges this global heterosexual shift and the urgent need to address and reduce the heterosexual spread of the disease (UNAIDS, 2001c).

Today, young women between the ages of 15 to 24 account for a substantial number of those living with HIV/AIDS globally. Young women are 1.6 times more likely than young men to be living with HIV/AIDS (UNAIDS, UNFPA & UNIFEM, 2004). Belize Ministry of Health reported that 5.5% of women and 3.9% of men who tested positive for HIV in 2007 were under the age of 15 years (NAC, 2008).

Regardless of age, data from a number of studies suggest that male-to-female transmission during sex is about twice as likely to occur as female-to-male transmission, if no other sexually transmitted infections (STIs) are present (Royce, Sena, Cates & Cohen, 1997; Quinn et al., 2000). A majority of women worldwide become infected through their male partners' high risk behaviors (Campbell, 1995; Coggins & Segal, 1998; UNAIDS, 2004). In one sentinel surveillance study for pregnant women in Belize City in 1984, more than 8% of women were seropositive (National AIDS Task Force, 1999).

Widespread recognition that gender issues are important to HIV transmission prevention (Campbell, 1995; Speizer, Whittle & Carter, 2005) has resulted in a limited number of initiatives for practical interventions to improve gender inequalities (Davis & Weller, 1999; Whitehead, 1997). In the absence of a vaccine, preventive measures, such as sexual health education and provision of condoms remain the most effective and affordable interventions to slow the HIV pandemic (UNAIDS, 2001c).

Critical to gender has been the absence of a heterosexual male focus in AIDS education and or participation in counseling, testing and safe sexual practices (Campbell, 1995; Seal & Ehrhardt, 2004). Men's knowledge, attitudes and roles (Seal & Ehrhardt, 2004) must be addressed. This must be done so that positive impact on men's sexual practices and behavior can help stem and subsequently reduce HIV transmission to their female partners (Campbell, 1995; Courtenay, 2000; Myers et al., 2003; Ross, Henry, Freeman, Caughy, & Dawson, 2004; Smith, 2004; Whitehead, 1997).

Study Rationale

Given the history of the HIV/AIDS epidemic, research prevention and intervention programs need to focus on specific male populations. Much of this research has targeted homosexuals and bi-sexuals (Marks & Crepaz, 2001), and substance abusers (McCusker et al., 1994; Senf & Price, 1994; McCoy et al., 1996; Bowen, Williams, McCoy & McCOy, 2001). Research of heterosexual populations have generally been of younger people and include adolescents (Norris, Ford, Shyr, & Schork, 1996; Buysse & Van Oost, 1997; Serovich & Green, 1997; Freidman et al., 2001; Johnson, McCaul, & Klein, 2002), and college students (Lewis, Malow, & Ireland, 1997). Limited research has focused on heterosexual men in the general population.

Greater understanding is needed regarding heterosexual males' safe sexual practices and factors that influence their practice. The research is beginning to acknowledge that the method of targeting heterosexual men through their female partners is not successful in stemming the spread of the AIDS pandemic (Campbell, 1995). Heterosexual men have generally been targeted for risk prevention through interventions with the women (Blanc, 2001; Campbell, 1995) to encourage use of male condoms. Women are often powerless to change the behaviors of their heterosexual male partners (Blanc, 2001; Campbell, 1995; Helzner, 2002).

Behavior change in the heterosexual male in the general population is a key issue for reduction in the heterosexual transmission (Marsiglio, 1993; Worth, 1989). HIV/AIDS research literature that reported HIV transmission in heterosexuals, in many cases, has occurred through high-risk behaviors (Buysse & Van Oost, 1997; Hoffman & Cohen, 1999; DeGuzman, 2001; Johnson, et al, 2002). High-risk behaviors have been categorized as unprotected sex through lack of correct and consistent condom use, having multiple sexual partners, and event-specific use of alcohol (Hendershot, Stoner, George, & Noris, 2007; Temple & Leigh, 1992; and Vanable, et al., 2004) and other substances (Bowen, et al, 2001; DeGuzman, 2001).

This research was a secondary data analysis of the Belizean, heterosexual adult male population, using the data set of the 1999 family health survey. It was an

epidemiologic study of self-reported Belizean male behavior and attitudes that were associated with male condom use and perception of HIV risk among Belizean adult men. A primary research question focused on the relationship between several bio-psychosocial variables, with specific attention to the relationship between benevolent machismo and condom use. Villereal and Cavazos (2005) referred to a positive machismo attitude as 'benevolent' and suggested this occurred among men as they grew older in their age and relationships.

Summary

The Caribbean region has the highest regional adult HIV prevalence second only to sub-Saharan Africa (UNAIDS, 2007). Heterosexual transmission is the primary mode of HIV transmission in Caribbean and Latin American countries (Cohen, 2006; Prata, Vahidnia, & Fraser, 2005), but sex between men is a recognized factor in the heterosexual transmission.

Belize is a microcosm of the Caribbean and Latin American regions. After its first seropositive diagnosis in 1986, Belize's increase in seropositive cases has been steady and significant, with a prevalence of 2.4% in the adult population by the end of 2005 (UNAIDS, 2007). HIV transmission has been recognized by the Ministry of Health as heterosexual. However, sex between men is a considered element in the Belize epidemic. This study explored associations of Belizean male demography, attitudes and behaviors associated with condom use and HIV risk perception.

CHAPTER II LITERATURE REVIEW

Theoretical Framework

Behaviors are shaped by the social and physical environments as well as an individual's biopsychological and physical status (Meade, 2006). Male and female sexual behaviors are partly biologically based. Gender is interwoven with biology (i.e., sex, whether one is male or female). A person's actions are defined as 'masculine' or 'feminine.' An individual's perceptions of gender are influenced by economic, institutional and policy contexts (Lundgren, Gribble, Green, Emrick, & DeMonroy, 2005). These perceptions affect the viewpoints on such things as sexual activity, marriage, fidelity, partner selection, contraceptive use, and drug use (Ray & Gold, 1996).

Most health behavior theories were adapted from the social and behavioral sciences, drawing on various disciplines, such as psychology, sociology, and consumer behavior that predict risk, behavior change and maintenance of safe behavior (Labrie, Schiffman, & Earleywine, 2002; Maharaj & Cleland, 2005). Psychosocial theories and constructs were very useful early in the HIV epidemic to identify individual behaviors associated with higher rates of HIV transmission. These continue to provide important guidance to interventions at the intrapersonal and interpersonal levels. The Health Belief Model (HBM) is an intrapersonal theory while Gender and Power Theory (GPT) is an interpersonal theory.

Gender and Power Theory

The Gender and Power Theory, developed by Connell in 1987, is a social structural theory developed out of philosophical writings on sexual inequality, gender, and power imbalance. Power is defined as the capacity to exert influence over others. Three broad social structures typify gender relations of men and women: sexual division of labor, sexual division of power, and invested emotional energy in partner. Three of the GPT elucidated sources of power (reward, expert, and legitimate) were first articulated by French and Raven in 1959 (Wingwood & DiClemente, 2000).

One example of GPT applied to HIV/AIDS was Bowleg, Belgrave and Reisen (2000). In their study of gender roles and relationship power strategies, aspects of GPT, were applied as predictors in a cross sectional study among Black and Latina women. They found that if women perceived they were at no risk for contracting HIV, their gender roles and power strategies were not important factors in their practices to reduce HIV/AIDS risk. A second example of GPT applied to HIV was research done by Pulerwitz, Gortmaker and DeJong (2000). These researchers used GPT to validate the Sexual Relationship Power Scale (SRPS). This scale was used to measure the relationship power dynamics relative to physical violence, health education and condom use for HIV/AIDS prevention.

Health Belief Model

The Health Belief Model is an intrapersonal level theory. It was developed in the 1950s by a group of public health service social psychologists in the United States to help explain why few people were participating in programs to prevent and detect disease or health related behaviors. These social psychologists theorized that people's beliefs about whether or not they were susceptible to disease, and their perceptions of the benefits of trying to avoid it, influenced their readiness to act.

With respect to HIV/AIDS the heterosexual male must see his susceptibility where he is at risk for HIV infection. He must be able to perceive the seriousness of being HIVpositive and believe in the effectiveness of the behavior, such as accurate and consistent condom use, to prevent negative health outcomes. The final "belief" is that the individual is capable of implementing and sustaining the behavior.

The HBM has been applied in numerous HIV/AIDS empirical research to explore women's HIV experiences (Mallory, 2008), or drug use, health history and perceptions (Brown and Van Hook, 2006), or describe health belief predictions for condom use by men (heterosexual or MSM) during vaginal, anal or oral sex (Coleman, 2007).

Theory application

Numerous studies have proven the usefulness of psychosocial theories and constructs (Labrie et al., 2002; Lundgren et al., 2005; Kimuna & Djamba, 2005; Maharaj & Cleland, 2005). Theories and models such as the GPT and the HBM together embrace the multiple aspects of this research that addressed the individual and his behaviors as part of a society. The GPT facilitated an assessment of the impact of structurally determined gender differences on interpersonal sexual relationships, i.e. perceptions of socially prescribed gender relations. This theory helped in the exploration of the influence of power or a lack of power in risk reduction choices. The HBM, one of the first theories of health behavior and still among the most widely recognized, addressed individual perceptions of threat posed by a health problem, benefits of avoiding the threat, and factors influencing decision to act. HBM also helped guide the search for "why" behaviors occur, and identified points for possible change. This epidemiologic research of the HIV/AIDS epidemic in Belize utilized both GPT and HBM to explain behaviors and identify potential prevention directions.

HIV Risk and Behavior Expectation

Research has established that risk for HIV is influenced by individual behaviors. What is considered appropriate male behavior may be long lasting or may vary across time. Appropriate behavior may develop as a result of cultural, ethnic and economic socialization (Lundgren et al., 2005). Much of the differences between men and women are developed through interactions with peers, family members, and other social contacts (Aral, 1994).

Behavior expectation may be generational where older men may expect different behaviors of younger generations than of their peers with the reverse being true as well. Behavior expectation may be context specific (Harper, 2007; Voisin, 2002), depending on whether the individual is with members of the same sex (Harper, 2007) or not (Blanc, 2001; Campbell, 1995; Helzner, 2002), in formal settings such as work places or in an informal setting (Campbell, 1995; Helzner, 2002). Behavior expectation may also be influenced by cohabitating or non-cohabitating contexts. Cohabitation may enhance or devalue the male's status (Harrison, O'Sullivan, Hoffman, Dolezal, & Morrell, 2006; Sternberg, 2000; & Helzner, 2002). Elevated male status is linked to a widely held concept of virility of the 'macho' man (Basham, 1976; Connell, 1993; Harrison et al., 2006).

Status elevation may occur, in part, by the number of partners or children a man has (Blanc, 2001; Dowsett, 2003; Flood, 2003; Harrison et al., 2006; Speizer et al., 2005; Sternberg, 2000). Elevated male status is an issue that is being increasingly addressed in the sexual and reproductive health initiatives (NAC, 2008). Having many wives or partners increases risk of HIV exposure for all, including children born from the unions (Campbell, 1995). HIV is largely spread through behaviors, including sexual and drug taking practices. There are groups with higher levels of risk behaviors than others. Behaviors are generally personal and private and, in some cases, illegal (Corsi, Kwiatkowski, & Booth, 2006; Leigh & Stall, 1993; Rees, Saitz, Horton, & Samet, 2001; Markowitz, Laestna, & Grossman, 2005). Commonwealth countries, such as Belize, have laws that criminalize homosexual behavior, making it difficult to develop public policy to help those who practice behaviors defined as criminal.

People, who engage in behaviors dubbed as criminal, are less likely to admit to the behaviors and voluntarily seek counseling and testing. Same sex relationships are therefore clandestine, exposing men and their partners and children to vulnerabilities of HIV/AIDS. Some men may publicly engage in heterosexual partnerships that they would otherwise avoid if there was not stigma and discrimination associated with homosexuality (Harper, 2007). In Belize, the NAC identified this difficulty as a major challenge in reaching MSM and other people living with HIV and AIDS (NAC, 2008). In Belize the machismo tradition may be a contributing factor. It has not been supportive of same sex relationships or partnerships (Whitehead, 1997).

Machismo Attitude

Within the Caribbean and Latin American cultures, masculinity is expressed through 'machismo'. Machismo was reflected in this study as generally positive attitudes of egalitarian, non-violence and non-sexist perspectives. Central to the idea of machismo is the concept of what is right, what is proper and how a man behaves (Basham, 1976; Blanc, 2001; Harrison et al., 2006). The main theory of masculinity asserts that men should be the material provider and protector (Basham, 1976; Sternberg, 2000).

The machismo socialization of the Latin American male provides the framework for what it is to be a man. Men are primarily and secondarily socialized into believing certain characteristics are definitive in determining their manliness and masculinity.

Socialization of masculinity in many societies begins as early as the first stages of infancy. During childhood the male is taught to express 'machismo' through aggressiveness, contempt of danger, and never running from fights (Staton, 1972). Conversely, machismo has also been taught to generations of men as the broad range of positive characteristics of family protector (Villereal & Cavazos, 2005). Machismo is an important value where a masculine, virile and active male image is contrasted to the norms of femininity, motherhood, virginity and passivity in women. Heterosexual males are generally encouraged to discard all that is feminine within themselves and to avoid activities or interests that can be construed as feminine (McClure, 1999). Even seeking out male assurance of their own masculinity, i.e. male bonding, can be construed as feminine (Tognoli, 1980).

This social construction of masculinity plays a role in behaviors associated with major sources of morbidity, including traffic accidents, homicides, unprotected sex, and alcohol related injuries (Sternberg, 2000). Behaviors, such as violence, addictions, and early paternity are also related to masculinity, espoused as machismo (Sternberg, 2000). This cultural form that masculinity takes may have negative consequences for public health. Hutchinson et al. (2007) found that many young Jamaican males acknowledged feeling social pressure to engage in behaviors that were perceived to be masculine or machismo, without regard for the possible negative consequences. Reported rates of high-risk sexual behaviors were high, and included early age of sexual initiation, multiple partnerships and inconsistent condom use with both steady and non-steady partners. In the Netherlands Kocken, van Dorst & Schaalma (2006), studying immigrant Dutch Caribbean young men, found statistical significance between intention to use condoms among men who adhered to machismo beliefs. They reported that they had multiple sexual partners.

Condom Use and Other Influences on Safer Sexual Behavior

Men in dating relationships are most likely to use condoms for protection against sexually transmitted infections (STIs), including HIV. Condom use has a temporal component in sexual relationships. Decrease in condom use is affected by the sexual 'safeness' of the woman as perceived by the heterosexual male (Payn, Tanfer, Billy, & Grady, 1997; Santelli, Brener, Lowry, Bhatt, & Zabin, 1998). Once a relationship stabilizes, sex without condoms often becomes the practice (Pleck, Sonenstein & Ku, 1993; Smith, 2004).

One important factor regarding the prevention of the transmission of any disease is awareness of its impact, causes of infection and steps to take to avoid infection. Ensuring HIV/AIDS awareness in the heterosexual male population can be a daunting and sensitive topic. Straightforward, relevant and accurate information on sex and sexuality is too often a taboo subject in countries around the world, including Belize (NAC, 2008). Perception of some HIV risk contributes to the successful increase in awareness of HIV/AIDS. Knowledge and awareness do not necessarily guarantee that the individual follows the proposed 'safer' sex practice of consistent and correct use of condoms (Smith, 2004).

Condom use has been used synonymously with the term 'safer sex' (LaBrie, & Earleywine, 2000) while the term 'risky sex' has been defined as penetrative sex

without a condom (LaBrie, Earleywine, Schiffman, Pedersen, & Marriot, 2005). Condoms, used consistently and correctly, have been promoted as the safest practice for those involved in sexual activity (Collumbein, Das, & Campbell, 2001; Goodkind & Ahn, 1997). The discussion presented by Moore (1997) provides an understanding of the need for a term that addresses the changing landscape of what can be labeled 'safer' sex. The most effective HIV risk prevention practice and least likely behavioral choice for a large number of heterosexual men is abstinence from penetrative sexual practices (Gillmore et al., 2003; Smith, 2004). From a public health standpoint, abstinence from all penetrative intercourse is a 'safer' sex ideal.

Non-penetrative sexual practices, such as oral sex and mutual masturbation, may be safer than consistent and correct use of condoms (Bogart, Cecil, Wagstaff, Pinkerton & Abramson, 2000; Sanders & Reinisch, 1999). Most heterosexual men typically view these as preliminary acts and not substitutes for penetrative vaginal intercourse (Bogart, et al., 2000) and equate 'sex' or 'sexual activity' with penetrative vaginal intercourse (Campbell, 1995; Sanders & Reinisch, 1999). Among sexually active heterosexual males, the use of male condoms is the most common HIV prevention method (Seal & Ehrhardt, 2004).

A strong male dislike for condom use is often enhanced by women's expressed reluctance for their male partners to use condoms. The reluctance, whether expressed or not, often stems from women's fear that their male partners would leave them or that their male partners would act on a belief that women were unfaithful in the relationship (Whitehead, 1997). Specific to the role played by the heterosexual male, Campbell (1995) suggests women are dependent on men in a fashion comparable to the 1950s, relying on men to be cooperative and compliant to attempts to persuade them to practice safer sex by consistently and correctly using condoms.

This reluctance augments the temporal positioning of condoms in many relationships and constitutes a barrier to consistent and correct use of condoms as the safer sex practice in the prevention of HIV/AIDS. Fear of rejection is among several barriers that affect the correct and consistent use of condoms. There is a perceived and, in some cases, real stigma attached to those infected with HIV and afflicted with AIDS-related diseases. The stigma that is attached to HIV infected persons is sometimes attached to condom use (Smith, 2004) and can negatively influence condom use when the individual, who uses condoms, is viewed as being HIV positive.

Male condom use is under their direct control given that men physically wear the condoms. Noar, Morokoff, & Redding (2002) suggest that success of the condom use behavior is influenced by the condom-specific sexual assertiveness of males, which is based on the perceived ability of the individual male to assert his desire to use a condom.

Incorrect and or inconsistent use of male condoms has been one of several risk factors associated with increased risk for transmission of sexually transmitted diseases. LaBrie et al. (2005), in a study of college males' alcohol use and its impact on condom use, confirmed that alcohol consumption contributed to risky sex behaviors, including inconsistent condom use. Having multiple sexual partners is also among these associated risk factors. Researchers reported that in a national survey of 2800 subjects, looking at behaviors that increased the risk of contracting AIDS (Bower, 1991), 8% of the sample reported multiple sex partners and less than one in five of those with

multiple partners reported consistent use of condoms in the past year. Alcohol and other drug use are sometimes related to the number of sexual partners heterosexual men will have (Santelli et al, 1998).

Alcohol and Other Substance Use

Alcohol abuse is recognized as a contributory factor to the spread of HIV/AIDS, because excessive alcohol consumption leads to promiscuous, irresponsible, high-risk sexual behaviors. The intoxicating effects of alcohol and many drugs alter judgment and inhibition (Santelli et al., 1998; Whitehead, 1997). Lowered inhibition exposes people to unsafe behaviors such as engaging in unprotected sex. An association was found between alcohol use and HIV sexual risk behaviors among drug users (Meade, 2006; Rees et al., 2001; Vanable et al., 2004) as well as non-drug users (Kandel, Yamaguchi, & Chen, 1992; Rawson, 2006).

The understanding between risky sexual behavior and drinking has been a difficult one to estimate accurately, perhaps because of the sensitive nature of the issue as well as the necessity of getting input from respondents directly. It is widely assumed that most survey respondents under report their actual alcohol consumption because they do not remember or because they do not want to admit to what might be considered excessive drinking (Mensch & Kandel, 1988).

Leibschutz et al. (2002) concluded that alcohol consumption and or other drug use are not stand alone factors in the substance using person. Their study of substance abusing men and women in a treatment facility found 72% had experienced physical and sexual abuse in their lives and three-quarters of the victimized subjects had experienced the interpersonal trauma as children. The direct experience of being abused as a child may increase a person's risk for alcohol related problems as an adult, particularly among women (Mullen & Flemming, 1998) with substance use playing a disinhibitive role in the adult's decision making process. Life events that occur early in life may also contribute to behaviors that place individuals at risk.

Psychosocial Factors

Research has shown that marital status is a good predictor of sexual behavior (Benefo, 2004; Hill, Cleland, & Ali, 2004; Payn et al., 1997; Santelli et al, 1998). This indication furthers the position that married men, compared to single men, are less likely to engage in risky sexual behavior and more likely to use condoms in an extramarital relationship (Hill, et al., 2004), particularly from a pregnancy prevention focus. Laumann, Gagnon, Michael, & Michael (1994) posited that married people, unlike unmarried people, were far more likely to have only one sex partner and therefore less likely to have concurrent partnerships.

Socio-demographic factors such as age, education, and marital status are among important factors that influence sexual behaviors. The young age of men, particularly at first intercourse, may be a risk factor for the transmission of HIV. Manlove, Terry-Human & Ikramullah (2006), studying data from the 2002 National Survey of Family

Growth, found the odds of fathering a child as a teenager to be more than two times greater for males who had their first sexual experience before the age sixteen compared to males whose first sexual experience happened at sixteen years or later.

Young men's first sexual experiences with older women or paid sex workers may also increase risk of exposure to HIV and other STIs (Parrado et al., 2005; Voisein, 2002). Included in these risky behaviors is a pattern where they engage with multiple partners in quick succession, (e.g., they form multiple serious relationships for short-term periods). The partners chosen are themselves often risk-takers. Part of this risk behavior among young people is utilization of sexual relationships as a way to access resources (Smith, 2004), oftentimes financial. Young men as well as young women are at risk. Young men may be socialized into different codes of sexual conduct that persist and influence later sexual lifestyles because of family background and social networks (Hill et al., 2004).

The desirability and continuity of sexual activity throughout adulthood and into later life has been investigated (Araujo, Mohr, & McKinlay, 2004; Enzlin, Mak, Kitter, & Demyttenaere, 2004; Gott & Hinchliff, 2003; Jung & Schill, 2004) and studies have shown that older adults do participate in risky sexual behaviors. Cooperman, Arnsten, & Klein (2007) found that men who were 49 years or older and were having unprotected sex or multiple partners, or participating in the exchange of sex for money or drugs were putting themselves or others at risk for HIV infection. Those with a history of HIV risk behavior may be continuing risky sexual practices later in life and, whether seropositive or seronegative, are at risk for transmitting or acquiring HIV infection.

Increasingly, doctors are finding people in their fifth and sixth decade of life infected with HIV. In many cases older people are less likely than younger people to talk about their sex lives, even with their doctors (Goodkin et al., 2003). The research literature shows that infection history and symptom manifestations of HIV infection in older adults substantially differ from those seen in younger people. HIV has been found to progress faster in older persons than in younger HIV-infected persons and may impact sexual desire and ability (Goodkin et al., 2003; Jung & Schill, 2004; Stoff, Khalsa, Monjan, & Portegies, 2004).

Level of education can impact a person's health literacy. Binson and Catania (1998) looked at what difficulty respondents had understanding vocabulary used in sexual behavior questions. They found that men, who were from minority ethnic groups, and those with less than secondary education completed were likely to report difficulty understanding terms like 'vaginal intercourse' and 'anal intercourse'.

Hicks, Barrangan, Franco-Paredes, Williams, & del Rio (2006) evaluated the association between health literacy (reading at or above a sixth grade level) and HIV/AIDS knowledge among patients using an inner city, public hospital urgent care facility. A majority of subjects were under the age of 40 and read at or below a sixth grade level. HIV/AIDS knowledge scores were significantly lower for those who had inadequate health literacy as compared to those who had marginal or adequate health literacy.

Such issues as language and religion are critical considerations for ethnic groups and help in planning health services. Bhopal's (2004) argument that 'ethnicity' is and should be viewed as different from 'race' rather than being used interchangeable as

synonyms. It can and often changes from one generation to the next or from one geographic locale to another.

Ethnicity

The changing world of the HIV epidemic is somewhat reflected in ethnicity as a critical aspect of people's lives. Increasingly, there is an interest in including race or ethnicity into health research. Definitions may change within the particular ethnic group over time and with temperance. An ethnic group was defined as one segment in the wider population with a strong expression of the religion, language, dress, food and other cultural expressions of their original community. While limited or subtle changes may be evident in the community over time, more apparent changes may occur as the ethnic group assimilates within the larger social culture. The cultural changes ethnic groups bring and the differences they encounter impact health of individuals.

Religion

The most common Western measure for religiousness is a method that employs a simple question asking study subjects which of a prescribed list of grouped religions or denominations they belong to. The simplest form of this method includes 5 broad categories, namely Catholic, Protestant, Jewish, None, and Other (Koneig, McCullough, & Larson, 2001). A more detailed list, presented by Roof and McKinney (1987), includes a more defined list of churches beyond the five the broad categories. This allowed for further sub-groupings of protestant religions. The broad heading of 'other' religions lists several response options.

One of the cultural attributes of ethnic groups may be religion. For Belize, the list of religious denominations was quite long but easily fell into several of the sub-groupings, particularly the protestant and 'other' category laid out by Roof and McKinney (1987). The elements described by Koenig et al. (2001) are very relevant to the role of religion in the culture of people's lives.

Religion is distinguished from spirituality by two attributes that are steeped in the culture of many ethnic groups in the broader society. In some religions, the benefit extends beyond the belief in a divine or superhuman power(s) and the practice of that belief (Koneig et al., 2001). One of these benefits may involve the attendance of religious services that improves the individual's social network (i.e. increasing social contacts or improving standing within the group).

In Belize, religion is influential beyond the search for the sacred and divine. It involves the church in the education of the people. Church involvement in education exists at the primary, secondary and tertiary levels. One implication is that religious influence is sustained throughout the formative years of individuals and outside of the 'organized system of beliefs, practices, rituals, and symbols designed to facilitate closeness to the sacred or transcendent.

Childhood Abuse

Childhood abuse, or child abuse, is recognized as any mistreatment or neglect of a child that results in non-accidental harm or injury and which cannot be reasonably explained. In the last two or more decades an increasing number of research has been done to assess the long-term impact of early childhood experiences with abuse and maltreatment. A large percentage of the research focused on sexual abuse rather than physical and emotional abuse and generally surveyed adolescents (Rodgers et al., 2004), women (Hillis, Anda, Felitti, & Marchbanks, 2001; Rodgers et al., 2004; Thompson, Arias, Basile, & Desai, 2002; Walker et al., 1999), substance use in adult women (Hillis et al., 2001; Horwitz, Widom, McLaughlin, & White, 2001), homosexual and bisexual men (Brennan, Hellerstedt, Ross, & Welles, 2007; Dilorio, Hartwell, & Hansen, 2002; Klein, Elifson & Sterk, 2007), and male prostitutes (Elifson, Boles, & Sweat, 1993).

In many cases, research focused on whether or not the individual experienced the particular abuse being investigated. Many of these studies suggested that childhood abuse and victimization led to a variety of problems and dysfunctions such as sexual promiscuity in the adult life (Hillis et al., 2001; Odonne-Paolucci, Genius, & Violato, 2001). In one Caribbean country, lack of condom use in adulthood was highly correlated to physical, emotional and or sexual abuse in the lives of men (Handwerker, 1993).

While childhood physical abuse research has focused primarily on girls' and women's histories, a few studies have investigated the effect of childhood abuse on heterosexual men. From the limited samples on heterosexual men, childhood physical abuse prevalence in men ranged from 28% in male college students (Miller & Lissak, 1999) to 51% in active-duty male soldiers in the U.S. Army (Rosen & Martin, 1996). The National Child Abuse and Neglect Data System identified parents, mothers specifically, as the most frequent abusers of boys. Holmes and Sammel (2005) found that research participant outcomes such as hostility, substance use and sexual risk were more common in men with childhood physical abuse histories. Zierler et al. (1991) found that men in the U.S. who had been sexually abused in their childhood were at two times the risk of HIV infection than men who had not been abused. Whether the victimization occurred to women or men, in both cases the result was increased sexual risk behaviors in adulthood.

Summary

The adult heterosexual male has long been acknowledged as the underlying cause of the feminization of the HIV epidemic. He has generally been ignored by researchers and programs. Relatively little research focus on the contextual, situational, or temporal variability of heterosexual male, high-risk behaviors. There has been a call for more research to be conducted to address the HIV/AIDS epidemic in relation to the heterosexual male in the general population (Courtenay, 2000; Schofield, Connel, Walker, Wood, & Butland, 2000; Whitehead, 1997). There is a need for research on

situational and other environmental factors that influence decisions to engage in behaviors known to support transmission of HIV.

This is essential to the development of comprehensive interventions that incorporate culture, economy, political, individual and societal factors that influence the spread of HIV. Change in the individual's personal health beliefs is a requisite to promoting change. For example, people who are intoxicated constantly, regardless of the drug, are more likely to be less inhibited (Zimmer & Morgan, 1997). Less inhibited persons are more likely to practice behaviors that are categorized as high risk. Alcohol related interventions should be considered in developing programs and services to increase safer sexual practices (LaBrie & Earleywine, 2000).

HIV interventions often target an individual's perception of risk, beliefs in severity of AIDS, beliefs in effectiveness of condom use and benefits of condom use or delaying onset of sexual relations. Willingness to practice preventive health behavior is dependent on the individual perceptions of health threat and vulnerability to the particular health problem or disease (Buunk, Bakker, Siero, van der Eijnden, & Yzer, 1998).

CHAPTER III METHODOLOGY

Study Population

The study population is Belizean men who participated in the 1999 Family Health Survey. This sample includes men from all administrative districts in the country, ethnic groups (excluding Mennonite[1]), marital groups and socio-economic statuses. The analysis is limited to adult men between the ages of 18-69. Exclusion criteria included men who reported having never engaged in any sexual activity or men who reported exclusively homosexual relationships.

Study Design

The study design was a quantitative, secondary data analysis of the 1999 Family Health Survey that was conducted by the Central Statistics Office (2000) in Belize. The existing data set was generated from survey interviews of men and women conducted in December 1999. Male respondents were between the ages of 13 and 69, and female respondents were between the ages of 15 and 49. The 1999 Family Health Survey was the first one to include men; it was a follow-up from a 1991 survey for women. The purpose of the male family health survey was to provide baseline data on the knowledge and attitudes of Belizean men on contraceptive use, child bearing and child rearing, HIV/AIDS, condom use and domestic violence.

The national survey used cluster sampling to select the participants. To achieve the defined sample of 2000 men between the ages of 13 and 69 years and allowing for a non-response rate of 10%, 2940 households were selected from an estimated country total of 45,455 households. The survey sought to interview one male per household. Households were apportioned into an estimated 30 households per cluster and distributed proportionately among the districts, resulting in 1,524 clusters countrywide. A sampling fraction of 1/15 of household clusters was used to yield 102 clusters. Only 98 clusters were used and a total of 1773 men (2.6% of the male population who lived in Belize in 1999) were successfully interviewed.

Male and bilingual interviewers were used for the data collection during a four week period. They were trained over a 3-day period, covering administrative and technical aspects necessary to carry out the survey interviews. Survey instrument preparation and training were supported by the Center for Disease Control (CDC) and the United States Agency for International Development (USAID) Regional Program on HIV/AIDS.[2] Survey instruments were completed in English and Spanish.

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[1] Mennonite, originally from Holland and Germany, are Canadians and Americans who sought refuge in Belize. Excluded communities were Little Belize in Corozal District, Blue Creek and Shipyard in Orange Walk District. All 3 communities were in the northern part of the country. Another community, Spanish Lookout, in the western district of Cayo, was also excluded. Mennonite communities generally function as separate governments in the general population.

[2] CDC and USAID Central American Regional Program on HIV/AIDS resource persons were Dr. Paul Stupp and Mr. Stan Terrel respectively.

Experienced professional staff from the CSO central and district level offices were included in the research in training, general oversight of the data collection and analysis. Similar to other CSO household surveys, field researchers interviewed respondents in their homes. District level supervisors for each data collection field team re-interviewed 3 respondents who had previously been interviewed by each of 61 field researchers. According to the Director General of the Statistical Institute of Belize (SIB), 3 re-interviews per interviewer are standard to the quality assurance process (G. Avilez, personal communication March 19, 2008).

The questionnaire was divided into 13 sections. The first section addressed demographic information and individual characteristics of the respondents. Sections 2 to 5 elicited information on fertility, reproductive history, and contraceptive knowledge and use, including vasectomy. Sections 6 and 7 covered partnership history and sexual activity. Sections 8 to 10 elicited knowledge and perceptions on HIV/AIDS, condom use, and family life education. Sections 11 and 12 addressed attitudes towards sexual and reproductive health issues. Section 13 was the final section of the instrument and elicited information on drug use and domestic violence. Except for section 12 that asked for respondents' opinions and beliefs, all sections included responses that allowed a respondent to skip subsequent questions or sections based on an answer to a previous question.

Protection of Subjects

An electronic data set was provided to the researcher by the Statistical Institute of Belize (formerly the Central Statistics Office). No identifying variables were included in the electronic data set. This project was approved by the Stony Brook University Committees on Research Involving Human Subjects (CORIHS) on April 6, 2007 (Project ID: 20076655).

Cleaning the Dataset

The initial dataset had 1773 available cases with male respondents aged 13 - 69 years and 916 variables. A total of 400 cases, 22.5%, were removed from the original dataset to facilitate an analysis of adult men between the ages of 18-69 who reported heterosexual behavior. Cases were removed for respondents who were less than 18 years of age (n=306), who reported never having sexual intercourse (n=78) or having sexual intercourse with men only (n=6).

After an examination of over 700 variables, 10% were selected for inclusion in the analysis of this study. Missing data, including don't know/not stated (DK/NS) responses and system missing, were not excluded from the analysis except where specified. System missing included non-response to particular questions and questions that were automatically skipped based on responses to prior questions. The latter were recoded to reflect the information that generated the skip-out.

Dependent variable HIV risk perception had more than 113 (9%) cases missing. This was the only variable with 50 or more missing cases. In order to verify that those who did not respond to the HIV risk perception questions did not represent a separate

subgroup of the study sample, the data set was separated into two groups: those cases with missing values for that variable and a second group of cases that responded to that question. T-test analysis confirmed no difference among the 2 groups.

Measures of Dependent and Independent Variables

There were 25 variables in the study. Two of these were dependent variables (condom use and perceived HIV risk) and 23 were independent variables. Independent variables included 6 biopsychosocial variables, 12 attitude variables and 5 behavior variables. About 2/3 of all variables were derived from single questions in the interview. One third was developed from composite measures, 2 of which were index measures creating the complex variables of benevolent machismo attitude and HIV awareness. The specific logic used in the creation of each recoded variables is available in Appendix A and B.

Condom use, the primary dependent variable, was a categorical variable using a single item from the survey instrument asking respondents if they were currently using condoms. Possible responses to this question were: yes (1), no (2), DK/NS (9). In recoding condom use the 'yes' response was coded as 1. 'No' responses were coded as (0). 'DK/NS' responses or system missing were coded as 'missing'. HIV risk perception, the second dependent variable, was developed from a question that asked respondents what risk they thought they had of getting HIV/AIDS. This variable was coded as yes (1) for some or great risk. Not much or no risk responses were coded as (0). 'DK/NS' responses or system missing were coded as 'missing'.

Biopsychosocial Independent Variables

Sociodemographic data was collected on age, religion, education, ethnicity, marital status and childhood abuse. Childhood abuse was included as a predisposing factor for dependent variable condom use. Demographic variable age was a continuous quantitative response elicited from one question in the survey instrument where ages ranged from 18 to 69 years.

Each respondent was asked to identify his religion or denomination from among 16 categories. The sixteen categories are similar to a format created by Roof and McKinney (1987), without the sub-category groupings featured. Over half of respondents identified Roman Catholic as their religion/denomination, hence the variable religion was recoded categorically as Other (0), Catholic (1), or None (2). 'DK/NS' responses and system missing were coded as 'missing'.

One question asked the highest level of education respondents had completed. While there were six possible response options ranging from 'none' to 'university degree', about three quarters of respondents identified 'none' or 'primary' education as the highest level of education completed. The variable education was recoded as 'post primary completion' with secondary or higher completion coded as '2' and primary or less identified as the highest level of education completed, coded as '1', and no formal education completed was coded as '0'.

Ethnicity was measured using one question from the survey instrument that asked what ethnic group each person belonged to and provided 13 response categories. These choices were collapsed to reflect an overwhelming majority of the respondents from three major ethnic groups in the population. One major ethnic group was 'Mestizo' (to include those who identified as Mestizo or Spanish). The second group was 'Black' (to include those who identified as Black/African, Creole, or Garifuna); and the third was 'Maya' (to include those who identified as Maya Ketchi, Maya Mopan, or Yucatan Maya). The remaining response categories were collapsed into a group coded as 'Other' (to include White/Caucasian, Chinese, East Indian, Mennonite, and Other). 'DK/NS' responses and system missing were coded as 'missing'.

The variable habitation status was developed from a question that asked what each respondent's current union status was and provided 8 possible choices in answer to this question. These were 'legally married and living with spouse', 'common-law union, visiting sexual relationship', 'legally married but not in a union', 'legally separated but not in a union', 'widowed and not in a union', 'divorced and not in a union', and 'not in a union'. For the purpose of this study, habitiation status was coded as a dichotomous variable with '1' defined as 'married or cohabiting' and '0' defined as 'visiting sexual relationship' and all other response categories of 'not in a union'. 'DK/NS' responses and system missing were coded as 'missing'.

Childhood abuse was a categorical measure of physical, emotional or sexual abuse in the home during childhood, with responses of yes (1), no (2) or DK/NS (9). All 'no' responses were recoded as '0'. 'DK/NS' responses and system missing were coded as 'missing'.

Attitudinal Independent Variables

Several variables reflected respondents' attitudes, beliefs and opinions. These included four composite measures of benevolent machismo attitude, six composite measures of HIV/AIDS awareness, one measure of attitude towards condom efficiency, and one measure of intention to inform partners of HIV status if a respondent was seropositive. Each of 18 attributes in the benevolent machismo attitude measure was from closed-ended questions. A majority (87%) of the attributes used in the HIV/AIDS awareness measure was drawn from open-ended questions where responses were elicited rather than required.

Benevolent Machismo Attitude

The four composite variables for benevolent machismo attitude were: mutual decision making, non-stereotype opinion, non-violence to women, and Benevolent Machismo Attitude Index (BMAI), which was an index created from these variables.

Mutual decision making was recoded from 3 questions as a dichotomous variable. The three questions asked respondents who should decide (1) how many children a couple should have; (2) whether a couple should use contraception; and (3) what type of contraception a couple should use. The same 8 response options were provided for each of these questions. One of these offered a response choice of both

partners while the other responses were 'the woman'; 'the man'; 'mother-in-law'; 'nurse/doctor/mid-wife'; 'religious leader'; 'fate'; 'other'. Response of 'both partners' to all 3 questions was coded as 'yes' (1). Any other response category, other than 'DK/NS' was coded as 'no' (0). 'DK/NS' responses and system missing were coded as 'missing.'

Non-stereotype opinion was developed from 3 composite measures namely 'same opinion', 'same age' and 'same treatment.' Non-stereotype opinion was coded 'yes' (1) if 'same opinion', 'same age', and 'same treatment' were 'yes'. All other response options were recoded as 'no' (0).

The composite measure 'same opinion' was developed from survey items which were: 'something is wrong with a boy who has not had sex by the time he is 16'; 'boys should go to prostitutes to become men'; 'it is important for a woman to be a virgin when she marries'; and 'it is okay for married men to have extra-marital affairs'. If participants responded to each of the four survey opinions as 'disagree' this was coded as 'yes' (1). All other response options, other than DK/NS, were coded as 'no' (0). 'DK/NS' responses and system missing were coded as 'missing.'

The composite measure, 'same age', was developed by combining two open-ended questions that separately asked what age a woman or a man should be at the time of their first sexual intercourse experience. If participants responded with the same age for both men and women this was coded as 'yes' (1). All other response options, other than DK/NS, were coded as 'no' (0). 'DK/NS' responses and system missing were coded as 'missing'. 'DK/NS' responses and system missing were coded as 'missing.'

The third composite measure, 'same treatment', was developed by combining two statements that asked whether (1) girls who got pregnant and (2) the boys who got them pregnant should be allowed to return/be in school. The same response for both girls and boys was coded as yes (1) and all other responses, except for 'DK/NS', were coded as no (0).

Non-violence towards women was a third variable used to measure benevolent machismo attitude based on a premise that it is not acceptable to hit (beat) a woman under any condition. Respondents were asked to indicate whether they 'agreed', 'disagreed', or 'DK/NS' for each of seven statements, relating to circumstances under which it was 'okay to beat a woman'. The circumstances under which respondents indicated whether it was 'okay to beat a woman' included when: food was not served on time; respondent was tired; woman was getting on respondent's nerve, or yelled at respondent, or had an affair, or didn't want sex; or when the kids are too noisy. These seven statements were recoded into the variable non-violence towards women where the response 'disagreed' for all seven statements was coded as 'yes' (1). All other responses, other than 'DK/NS', were coded as 'no' (0). The 'DK/NS' responses and system missing were coded as 'missing.'

Benevolent Machismo Attitude Index (BMAI) was an index score defining machismo attitude. The BMAI was calculated by multiplying the mean score of the valid machismo attitudinal variables by 3 (the total number of variables in the index) to derive a weighted total index score for each case. A score of 0-1 was defined as low benevolent machismo. A score of 1.1 – 2 was defined as moderate and a score of 2.1 - 3 was defined as high benevolent machismo.

A principal component (factor) analysis confirmed the fit for attributes included in the development of the three variables forming the BMAI. When these attributes were entered as binaries into a factor analysis for the index, 4 components (factors) were extracted in a rotated factor matrix (Kinnear & Gray, 2004). The first component had 6 attributes, each with high loadings above 0.4 as described by Kinnear and Gray (2004). All were relevant to the non-violence towards women variable. The first component was combined with the fourth component that had one single attribute loading high and relevant to the non-violence towards women variable. The second component had 3 attributes with high loadings that were relevant to the mutual decision-making variable and the third component had 6 attributes loading highest and reflecting the non-stereotypical opinion variable. Thus, all 4 components of the factor matrix confirmed that the 18 attributes identified for the 3 variables in the BMAI did fit the index.

HIV/AIDS awareness

Attitudinal awareness in this study referred to a level of awareness about HIV and AIDS that resulted from personal and contextual experiences. It also reflected factual knowledge about HIV infection and prevention, and the resulting impact on individuals, groups and societies. HIV/AIDS awareness was measured by five variables about knowledge of HIV infection and transmission, personal knowledge and experiences. An index, the HIV/AIDS Awareness Index (HAI), was developed from these 5 variables.

HIV/AIDS transmission knowledge, the first variable of the index, was derived from one open-ended question that asked for multiple responses of ways a person could acquire the HIV/AIDS virus. Eleven response options that were relevant to how HIV is transmitted were chosen from a list of 16 options. Respondents who selected 3 relevant responses (about one quarter of all relevant responses) were deemed to have adequate knowledge about how HIV is transmitted. A score of 3 responses was coded as 'yes' (1). Scores of 2 or less were coded as 'no' (0) to reflect 'inadeqate' knowledge of how HIV is transmitted. The full list of response options are detailed in Appendix B.

HIV/AIDS infection knowledge, a second variable in the HIVAwareness Index, was also recoded from multiple responses to one open-ended question that asked how anyone could avoid getting HIV/AIDS. There were 11 available responses. Respondents who identified one quarter of the response or more were defined as having 'adequate' knowledge about how to avoid HIV/AIDS infection. A response score of 3 or more was coded as 'yes' (1). Scores of 2 or lower were coded as 'no' (0). The responses used in this variable are detailed in Appendix B.

Personal Knowledge was developed from one question that asked 'do you personally know anyone who has HIV/AIDS or has died from AIDS'. Response options were yes, no or DK/NS. A 'yes' response to the question was coded as (1) and 'no' responses were coded as (0).

Factual knowledge was a fourth variable used to measure HIV/AIDS awareness. It was developed from two questions. The first was a dichotomous (yes/no) question that asked respondents if they thought a person could be infected with the AIDS virus and not show symptoms. The second dichotomous (yes/no) question asked 'is there a

cure for AIDS?' Respondents who gave a 'yes' response to first of these questions and a no response to the second was coded 'yes' (1) for the factual knowledge variable and all other responses were coded as 'no' (0).

Awareness leading to behavior change, the last variable in the index, was developed from one open-ended question that asked respondents how each had modified his behavior since he first heard about HIV/AIDS. While the question was open-ended, a number of possible relevant response options were available for interviewers to indicate if the respondent gave that option. These are detailed in Appendix B. Awareness leading to behavior change was defined as 'yes' and coded as '1' if respondents identified one or more of four behaviors (namely abstinence, condom use, reduction in the number of partners, and monogamy/fidelity). These behaviors are generally promoted in the popular and research literature (Baldwin & Baldwin, 1988; London, 2005; Rosenberg, 2002; Steele et al., 2006) as HIV awareness behavior changes that are made. Identification of none or other behavior changes were coded as 'no' (0). The 'DK/NS' responses and 'system missing' were coded as 'missing.'

An HIV/AIDS Awareness Index (HAI) was created by multiplying the mean score of the valid HIV awareness variables by 5 to derive a weighted total index score for each case. A score of 0 – 1.5 defined low HIV awareness. A score of 1.6 – 3.5 defined moderate and a score of 3.6 – 5.0 defined high HIV awareness. Factor analysis was done for the HAI to confirm that the measures proposed would indeed fit the index. Twenty-three recoded binary attributes, about three-quarters of which were drawn from questions with open-ended responses, were entered into a factor analysis for the proposed variables. Seven components (factors) were extracted and reviewed.

In the first component, 6 out of 7 attributes were relevant to the avoid infection knowledge variable. One attribute was relevant to the HIV transmission knowledge variable. Component 2 had four high loading attributes that were relevant to the HIV transmission knowledge variable. Two attributes, reflecting the factual knowledge variable, loaded highest in component 3. Four attributes that made up the behavior change variable loaded high in the fourth component of the factor matrix. Components 5and 6 had high loadings of attributes proposed for the avoid infection knowledge and component 7 had a high loading for the one attribute of the personal knowledge variable. These 7 components of the factor matrix confirmed that 23 proposed attributes could be used in creating proposed variables of the HIV/AIDS Awareness Index.

Tell HIV+ Status

Tell HIV+ status was developed as a variable defined as 'yes' (1) if respondents said they would tell their partners if they had the AIDS virus. This question elicited responses of 'yes', 'no', and DK/NS. 'No' responses were coded as (0). 'DK/NS' responses and system missing were coded as 'missing'.

Condom Efficient

Condom efficient was a dichotomous variable, developed from one question that asked respondents how efficient they thought condoms were in preventing the transmission of AIDS. Response options were 'very efficient', 'efficient', 'not very efficient', 'inefficient', 'other', and 'DK/NS'. The variable was coded as 'yes' (1) if respondents said condoms were 'very efficient' or 'efficient' in preventing the transmission of HIV/AIDS and coded as 'no' (0) for 'not very efficient', 'inefficient', or 'other' responses. 'DK/NS' responses and system missing were coded as 'missing'.

Behavior Variables

Regular service attendance was a behavioral measure of religiousness. The question and response options were similar to one measure included in the Duke Religion Index (Koenig, Meador, & Parkerson, 1997). Respondents were asked how often they attended religious services and given 5 response options of 'at least once per week', 'at least once per month', 'less than once per month', 'special occasions', or 'doesn't attend at all' In this study the variable was coded dichotomously and defined as 'attend at least once per month' for response options that attend at least once per week or once per month (1) and all other responses, other than 'DK/NS', were coded as '0'. 'DK/NS' responses and system missing were coded as 'missing'. Respondents were asked how many females they had sexual intercourse with in the past 3 months. This variable was dichotomously recoded as multiple partners and defined as yes (1) if respondents reported having 2 or more partners in the past 3 months. Respondents who reported having none or one partner were recoded as no (0).

Three variables used to measure substance use were binge drinking, heavy drinking and drug use. The first measure was recoded as binge drink from one question that asked respondents to report the number of alcoholic beverages consumed on any one occasion. Respondents who reported consuming 5 or more drinks on one occasion were coded as yes (1) to binge drinking and those reporting less than five were coded as no (0) to binge drinking. The 'DK/NS' responses and system missing were coded as 'missing'. According to the International Center for Alcohol Policies a general consensus is that a person is binge drinking if he consumes 5 or more drinks on an occasion.

A composite measure was developed for heavy drinking of alcohol and defined as binge drinking (explained above) at least weekly. The dichotomous recode was yes (1) for all cases that satisfied the composite measure's definition and no (0) for all other responses, other than 'DK/NS' responses. The second part of the composite measure's definition (at least weekly) was recoded from a question that asked respondents how often they consumed alcoholic beverages. Response choices included: 'daily', 'on weekend', 'once a month', 'special occasions only', and 'other'. Responses to 'daily' or 'weekend' choices were coded as yes (1), other choices were coded as no (0) and 'DK/NS' responses and system missing were coded as 'missing'.

Drug use was a third substance use measure created from 3 survey questions. A yes response for any of the three questions asking respondents if they were presently

using marijuana or crack cocaine or heroin was coded as yes (1), other responses, other than 'DK/NS', were coded as no (0). 'DK/NS' responses and system missing were coded as 'missing'.

Research Question

What biopsychosocial, attitudinal or behavioral factors are associated with condom use and HIV risk perception in heterosexual males in Belize?

Hypotheses

Eight hypotheses were generated around the two dependent variables and based on each of the three groups of variables. The hypotheses were: namely,

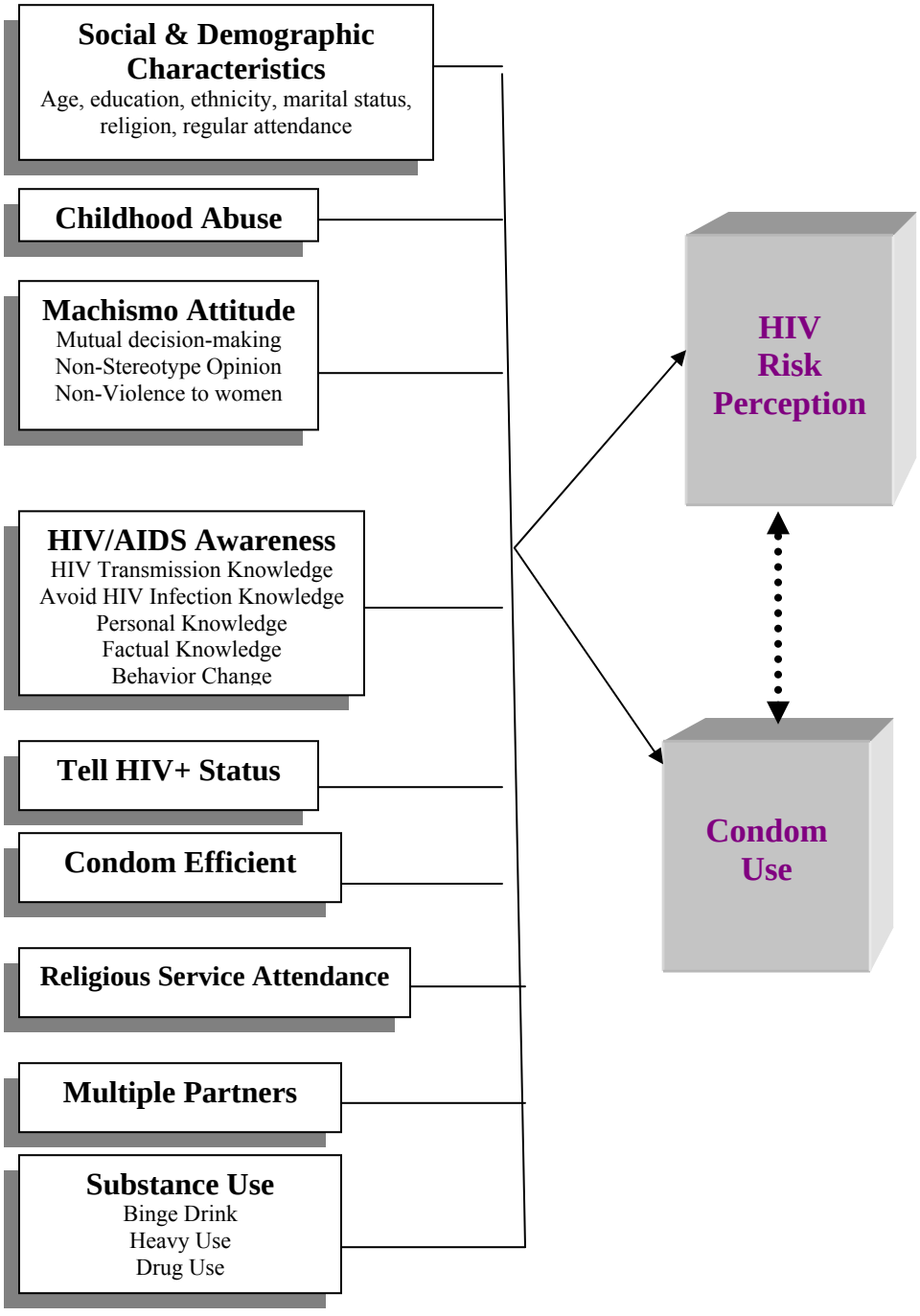
1. There is a relationship between age, ethnicity, religion, education, habitation status or childhood abuse and condom use.
2. There is a relationship between age, ethnicity, religion, education, habitation status or childhood abuse and perceived HIV risk.
3. There is a relationship between mutual decision making responsibility, nonstereotype opinions, non violence to women, positive machismo, intention to tell seropositve status, belief that condoms are efficient in preventing HIV transmission or perception of risk for HIV infection and condom use.
4. There is a relationship between mutual decision making responsibility, nonstereotype opinions, non violence to women, positive machismo, intention to tell seropositve status, or belief that condoms are efficient in preventing HIV transmission and perceived HIV risk.
5. There is a relationship between HIV transmission knowledge, HIV avoidance knowledge, knowledge of ≥ 1 HIV+ person, factual HIV knowledge, awareness leading to behavior change since learning about HIV, or HIV awareness and condom use.
6. There is a relationship between HIV transmission knowledge, HIV avoidance knowledge, knowledge of ≥ 1 HIV+ person, factual HIV knowledge, awareness leading to behavior change since learning about HIV, or HIV awareness and perceived HIV risk.
7. There is a relationship between regular attendance at religious services, having multiple partners, binge drinking, heavy drinking or drug use and condom use.
8. There is a relationship between regular attendance at religious services, having multiple partners, binge drinking, heavy drinking, drug use or condom use and perceived HIV risk.

Conceptual Model

Figure 1 presents the conceptual model being examined and tested in this study. On the left side of the model, independent variables believed to be associated with adult risk behaviors are delineated. Two dependent measures, perceived HIV risk and condom use, appear on the right. The hypothesized relationships were based on previous research findings in the published literature and principles of the Health Belief Model (Brown, 1999). Some elements from the Gender and Power Theory (Wingwood & DiClement, 2000) were also evident in the model used to guide this study.

In this statistical model condom use was recognized as a function of demographic characteristics including ethnicity, age, religion, education, marital status, and childhood abuse. It was further recognized as a function of machismo attitudes, HIV and AIDS awareness, religious service attendance, the number of female sexual partners in the past 3 months, and substance use. HIV risk perception was recognized as a function of demographic characteristics, childhood abuse, machismo attitudes, HIV/AIDS awareness, religious service attendance, number of female sexual partners, and substance use. Respondents' intention to tell if their HIV status was positive and perception of the efficiency of male condoms in preventing the transmission of HIV were also included in the model.

Figure 1: Conceptual Model Being Tested



Conceptual model being tested

Analysis Plan

Confidence in the quality of data was reportedly secured through rigorous techniques applied to the data collection process (CSO, 1999). Researcher bias may have been included in the primary data collection and analysis processes. Given the large sample size, random selection process, rigorous training of interviewers, and quality checks on the data collection, bias or data collection concerns should be equally distributed in the study sample.

A quantitative secondary analysis was conducted of a subset of 1373 males between the ages of 18 and 69 years of age, who reported heterosexual behavior. The Statistical Package for Social Sciences (SPSS) 15.0 for Windows was used to analyze the data. Descriptive statistical analysis was done prior to inferential statistical analysis to summarize measurements of variables used in the study and to address issues of recoding. Chi-square analysis was used to test associations between the two dependent variables, between each dependent variable and individual independent variables, and between independent variables. The p value was set at $\leq .05$ to determine statistical significance.

With respect to inferential statistical analysis, logistic regression was used to examine associations between key independent and dependent variables. An examination of the predicted probabilities was done through model building. Model building involved seeking the most stringent model that still explained the data. Hosmer and Lemeshow chi-square test of goodness of fit was the recommended test for overall fit of logistic regression (Lemeshow & Hosmer, 1982) where a finding of non-significance was consistent with the conclusion of 'adequate fit'. Preliminary 'main effect' first models looked at the influence of single covariates on the outcome variable and these were followed by 'fitting' adjusted models that looked at how two or more covariates influenced each outcome variable.

One important part of the model building process was to minimize the number of predictor variables in the model to keep it as numerically stable as possible (Hosmer & Lemeshow, 2000). Large numbers of predictors can increase the estimated standard errors. Variables of importance could be lost with the use of the traditional and more stringent p-value of ≤ 0.05. Hosmer and Lemeshow (2000) proposed use of a p-value of <0.25 for predictor variables identified during the descriptive analysis was used to assist in model building. This assured inclusion of all clinically and centrally relevant variables in the model regardless of the statistical significance.

The Wald statistic and its related p-value, along with the Odds Ratio (OR), were useful in facilitation of what independent variables were best for a final logistic regression model. The Wald statistic, included in the SPSS procedure to test each independent variable for significance of individual logistic regression coefficients [i.e. whether an association (statistical significance) existed between independent and dependent variables], was used to find predictor variables that were not significant (by the Wald statistic and its corresponding probability level) and removed from consequent models in the 'best fit' model building process.

The OR was also included in the SPSS procedure as Expβ in the 'Variables in the Equation' table. It was used to measure relationship (association) between variables

(value of 1.0 indicative of no relationship), size of the relationship (difference from 1.0 in either direction), and whether the relationship was positive (OR greater than 1.0) or negative/inverse (OR less than 1.0). This association measure was important in determining which predictor variables contributed to the fit of the 'best' logistic regression model.

Hierarchical stepwise logistic regression was also useful for exploring and determining what predictors contributed to the 'best' logistic regression model. The forward stepwise procedure began with the 'constant only' model. Variables that had statistical significance at the p .05 level were included. The SPSS stepwise procedure automatically identified independent variables that were included and excluded from the final model. The end result of this process was a 'main effects' model. Once a 'main effects' model was reached, there were subsequent checks for interactions in the model. Interactions signaled that the effect of one or more variables was not constant over levels of another. Decisions to include an interaction term in the model were based on statistical considerations as well as the experience of past research.

CHAPTER IV RESULTS

Univariate Descriptives

Biopsychosocial Characteristics

Study participants were primarily cohabiting, Catholic, Mestizo, who reported no childhood abuse, had a median age of 35 and no more than primary school education (see Table 1). Among those who did report childhood abuse, a majority (60%) indicated physical abuse alone, 12% indicated emotional abuse alone, and 2% indicated sexual abuse. Of particular note was that almost 30% had no formal education whatsoever; and 87% of those responding to the question on habitation were cohabiting.

Table 1: Biopsychosocial Characteristics (N=1373)

Variables	Frequency	Percent
Age		
18-24	233	17.0
25-34	423	30.8
35-44	352	25.6
45-54	186	13.5
55+	179	13.0
Ethnicity		
Black	441	32.1
Mestizo	708	51.6
Maya	132	9.6
Other	63	4.6
Missing	29	2.1
Religion		
Catholic	746	54.3
Other	477	34.7
None	144	10.5
Missing	6	0.4
Education		
Post-Primary	346	25.2
Primary	632	46.0
No formal education	392	28.6
Missing	3	0.2

Variables	Frequency	Percent
Cohabiting		
No	148	10.8
Yes	1008	73.4
Missing	217	15.8
Childhood Abuse		
No	1244	90.6
Yes	121	8.8
Missing	8	0.6

Attitudinal and Awareness Characteristics

Most of the study participants scored highly on variables measuring benevolent machismo. Two of the three machismo attitude variables were reported positively by at least 60% of the respondents, and over 70% scored moderate to high on the overall index, Benevolent Machismo Attitude Index (see Table 2).

Table 2: The BMAI and its Attitudinal Characteristics (N=1373)

Variables	Frequency	Percent
Mutual Decision-making		
No	361	26.3
Yes	953	69.4
Missing	59	4.3
Non-stereotype Opinion		
No	657	47.9
Yes	677	49.3
Missing	39	2.8
Non-violence to Women		
No	412	30.0
Yes	904	65.8
Missing	57	4.2
Benevolent Machismo Index		
Low	393	28.6
Moderate	586	42.7
High	392	28.6
Missing	2	0.1

Over half of respondents had factual knowledge of general HIV disease characteristics and knowledge of how HIV was transmitted. Nevertheless, less than half were scored as having adequate knowledge of how to avoid HIV infection, or

reported an awareness leading to changed behavior as a result of HIV knowledge. More than three quarters of the study respondents had a low or moderate overall HIV awareness score (see Table 3).

Table 3: The HAI and its Characteristics (N=1373)

Variables	Frequency	Percent
HIV Transmission Knowledge		
No	495	36.1
Yes	791	57.6
Missing	87	6.3
Avoid HIV Knowledge		
No	701	51.0
Yes	601	43.8
Missing	71	5.2
Personal Knowledge		
No	845	61.5
Yes	447	32.6
Missing	81	5.9
Factual Knowledge		
No	342	24.9
Yes	758	55.2
Missing	273	19.9
Behavior Change		
No	798	58.1
Yes	511	37.2
Missing	64	4.7
HIV Awareness Index		
Low	409	29.8
Moderate	653	47.6
High	311	22.7

Of great importance was that close to 80% of heterosexual male respondents saw themselves at little or no risk for HIV, less than half thought that condoms were efficient in preventing HIV transmission, and close to 10% would not tell their partner if they were HIV positive (see Table 4).

Table 4: Other HIV Attitudinal Characteristics (N=1373)

Variables	Frequency	Percent
Perceived HIV Risk		
No	1089	79.3
Yes	171	12.5
Missing	113	8.2

Variables	Frequency	Percent
Tell HIV+ Status		
No	136	9.9
Yes	1130	82.3
Missing	107	7.8
Condom Efficient		
No	483	35.2
Yes	598	43.6
Don't Know	222	16.1
Missing	70	5.1

Behavioral Characteristics

Just over 40% of respondents reported that they attended religious services at least once each month. While less than 10% of the sample reported having multiple partners, almost 20% of respondents did not report the number of female partners with whom they had sexual intercourse in the past 3 months.

Over 30% reported binge drinking and almost 20% reported heavy drinking. Use of marijuana, crack cocaine, or heroin was reported by approximately 6% of respondents. Less than one quarter of all respondents reported using condoms at the time of the study. Of note was that one half (686) of the sample reported they had never used condoms (see Table 5).

Table 5: Behavioral Characteristics (N=1373)

Behavioral Variables	Frequency	Percent
Regular Service Attendance		
No	662	48.2
Yes	551	40.1
Missing	160	11.7
Multiple Partners		
No	987	71.9
Yes	130	9.5
Missing	256	18.6
Condom Use		
No	1048	76.3
Yes	318	23.2
Missing	7	0.5

Behavioral Variables	Frequency	Percent
Binge Drink		
No	760	55.4
Yes	493	35.9
Missing	120	8.7
Heavy Drink		
No	992	72.3
Yes	260	18.9
Missing	121	8.8
Drug Use		
No	1280	93.2
Yes	89	6.5
Missing	4	0.3

Bivariate Associations with Condom Use

Biopsychosocial Characteristics

Condom Use was statistically significantly associated with age, ethnicity, education, and cohabiting status (see Table 6). Those heterosexual males who were more likely to use condoms were under age 35, not cohabiting, had post primary education and were black. Of particular note was that of the 900 males in the study who were not using condoms at the time of their last sexual intercourse, 58 were not in a cohabiting relationship.

Table 6: Biopsychosoical Characteristics by Current Condom Use

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Age	(n=1048)	(n=318)	120.258	4	.000
18-24	12.1%	33.3%			
25-34	28.9%	37.1%			
35-44	27.9%	18.2%			
45-54	15.0%	8.8%			
≥55	16.1%	2.5%			
Ethnicity	(n=1027)	(n=310)	50.265	3	.000
Black	28.8%	46.5%			
Mestizo	54.9%	44.8%			
Maya	12.0%	2.6%			
Other	4.3%	6.1%			
Religion	(n=1046)	(n=315)	3.768	2	.152
Catholic	53.5%	57.8%			
Other	36.3%	30.5%			
None	10.1%	11.7%			

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Education	(n=1047)	(n=316)	73.742	2	.000
Post-Primary	19.9%	42.4%			
Primary	47.7%	41.5%			
None	32.5%	16.1%			
Habitation Status	(n=900)	(n=249)	153.314	1	.000
Cohabiting	93.6%	63.9%			
Not cohabiting	6.4%	36.1%			
Childhood Abuse	(n=1042)	(n=316)	.236	1	.627
No	90.9%	91.8%			
Yes	9.1%	8.2%			

Attitudinal and Awareness Characteristics

The only Benevolent Machismo Attitude variable that was statistically significantly associated with condom use was non-stereotype opinion (see Table 7). Males who used condoms were more likely to have a non-stereotypical opinion of women.

Table 7: BMAI and Attitudinal Characteristics by Condom Use

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Mutual decision making	(n=993)	(n=314)	1.513	1	.219
No	28.4%	24.8%			
Yes	71.6%	75.2%			
Non-stereotype Opinion	(n=1010)	(n=317)	5.227	1	.022
No	50.9%	43.5%			
Yes	49.1%	56.5%			
Non-violence to Women	(n=1002)	(n=308)	1.730	1	.188
No	30.4%	34.4%			
Yes	69.6%	65.6%			
Benevolent Machismo Index	(n=1046)	(n=318)	3.217	2	.200
Low	28.9%	28.3%			
Moderate	43.7%	39.3%			
High	27.4%	32.4%			

Increased condom use was significantly associated with increased knowledge about HIV transmission, behavior change since learning about HIV, and higher overall HIV Awareness Index (see Table 8).

Table 8: The HAI and its Characteristics by Current Condom Use

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Transmission knowledge	(n=962)	(n=317)	12.636	1	.000
No	41.2%	30.0%			
Yes	58.8%	70.0%			
Avoid Infection Knowledge	(n=978)	(n=317)	3.116	1	.078
No	55.2%	49.5%			
Yes	44.8%	50.5%			
Personal Knowledge	(n=971)	(n=314)	1.866	1	.172
No	66.3%	62.1%			
Yes	33.7%	37.9%			
Factual Knowledge	(n=816)	(n=279)	1.308	1	.253
No	32.0%	28.3%			
Yes	68.0%	71.7%			
Behavior Change	(n=1003)	(n=299)	27.890	1	.000
No	64.8%	47.8%			
Yes	35.2%	52.2%			
HIV Awareness Index	(n=1048)	(n=318)	33.896	2	.000
low	33.4%	17.6%			
moderate	46.4%	51.6%			
high	20.2%	30.8%			

Males who reported using condoms at the time of the study were statistically significantly more likely to believe that condoms are efficient, more likely to believe that they were at high risk for HIV, and less likely to tell their partners if they were HIV positive. An important observation was that only 51% of the males who were not using condoms believed that condoms were efficient in preventing HIV. One hundred and two (11%) of the 946 men who were not using condoms perceived themselves at some risk for HIV infection (see Table 9).

Table 9: Other HIV Attitudinal Characteristics by Current Condom Use

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Tell HIV+ Status	(n=952)	(n=307)	5.251	1	.022
No	9.7%	14.3%			
Yes	90.3%	85.7%			
Condom Efficient	(n=979)	(n=317)	72.090	2	.000
No	38.2%	34.1%			
Yes	51.4%	62.5%			
Don't Know	21.5%	3.5%			
Perceived HIV Risk	(n=946)	(n=307)	24.219	1	.000
No	89.2%	78.2%			
Yes	10.8%	21.8%			

Behavioral Characteristics

Condom Use was statistically significantly associated with all of the behavioral characteristics studied (see Table 10). Men who used condoms were more likely to have multiple partners, binge drink, heavy drink, use drugs, and less likely to attend religious services regularly. Of 830 respondents who reported not using condoms, 54 (7%) had multiple partners. Among those who reported condom use at the time of their last sexual intercourse experience, 156 (53%) reported binge drinking and 36 (11%) reported drug use.

Table 10: Behavioral Characteristics by Current Condom Use

Characteristics	Current Condom Use		X^2	df	Sig.
	No	Yes			
Regular Attendance	(n=930)	(n=278)	18.248	1	.000
No	51.3%	65.8%			
Yes	48.7%	34.2%			
Multiple Partners	(n=830)	(n=280)	86.233	1	.000
No	93.5%	72.9%			
Yes	6.5%	27.1%			
Binge Drink	(n=959)	(n=289)	38.297	1	.000
No	65.3%	45.0%			
Yes	34.7%	55.0%			
Heavy Drink	(n=958)	(n=289)	31.594	1	.000
No	82.8%	67.5%			
Yes	17.2%	32.5%			

Characteristics	Current Condom Use		X^2	df	Sig.
	No	Yes			
Drug Use	(n=1045)	(n=317)	15.729	1	.000
No	94.9%	88.6%			
Yes	5.1%	11.4%			

Bivariate Associations with Perceived HIV Risk

Biopsychosocial Characteristics

Higher perceived HIV Risk was significantly associated with lower age, Black ethnicity, Catholic religion, and not cohabiting (see Table 11). Of particular note was that more than one half of respondents who were under age 35 or Catholic perceived themselves at some risk for HIV infection. Although cohabiting respondents were the most likely to perceive no risk, a large percentage of cohabiting heterosexual males reported they perceived some or great risk for HIV infection.

Table 11: Biopsychosocial Characteristics by Perceived HIV Risk

Characteristics	Perceived HIV Risk		X^2	df	Sig.
	NO	YES			
Age	(n=1089)	(n=171)	16.336	4	.003
18-24	15.8%	25.1%			
25-34	30.5%	35.7%			
35-44	26.9%	18.7%			
45-54	13.8%	12.9%			
≥55	13.0%	7.6%			
Ethnicity	(n=1064)	(n=168)	12.201	3	.007
Black	33.5%	42.3%			
Mestizo	54.1%	42.9%			
Maya	7.2%	11.9%			
Other	5.2%	3.0%			
Religion	(n=1085)	(n=169)	5.984	2	.050
Catholic	52.8%	62.1%			
Other	36.6%	27.2%			
None	10.6%	10.7%			
Education	(n=1088)	(n=170)	.412	2	.814
Post-Primary	26.7%	27.1%			
Primary	46.9%	48.8%			
None	26.4%	24.1%			

Characteristics	Perceived HIV Risk		X^2	df	Sig.
	NO	YES			
Cohabiting Status	(n=932)	(n=126)	23.096	1	.000
Not cohabiting	11.5%	27.0%			
Cohabiting	88.5%	73.0%			
Childhood Abuse	(n=1083)	(n=171)	.002	1	.968
Yes	8.7%	8.8%			
No	91.3%	91.2%			

Attitudinal and Awareness Characteristics

Perceived HIV Risk was not significantly associated with any of the Benevolent Machismo Attitudinal Index characteristics of the respondents (See Table 12).

Table 12: Benevolent Machismo Index and Attitudinal Characteristics by HIV Risk

Characteristics	Perceived HIV Risk		X^2	df	Sig.
	No	Yes			
Mutual decision making	(n=1053)	(n=168)	.188	1	.665
No	27.0%	28.6%			
Yes	73.0%	71.4%			
Non-stereotype Opinion	(n=1070)	(n=170)	.716	1	.397
No	48.8%	45.3%			
Yes	51.2%	54.7%			
Non-violence to Women	(n=1045)	(n=166)	1.481	1	.224
Yes	29.7%	34.3%			
No	70.3%	65.7%			
Benevolent Machismo Index	(n=1089)	(n=171)	3.983	2	.136
Low	27.4%	32.2%			
Moderate	43.7%	35.7%			
High	28.9%	32.2%			

The only HIV Awareness Index variable which was statistically significantly associated with perceived HIV risk was awareness leading to behavior change after learning about HIV/AIDS. Males with higher perceived HIV risk were more likely to have changed one or more behaviors (see Table 13).

Table 13: HIV Awareness Index and Characteristics by Perceived HIV Risk

Characteristics	Perceived HIV Risk		X^2	df	Sig.
	No	Yes			
Transmission Knowledge	(n=1076)	(n=171)	2.261	1	.133
No	38.8%	32.7%			
Yes	61.2%	67.3%			
Avoid Infection Knowledge	(n=1089)	(n=171)	.096	1	.757
No	53.9%	52.6%			
Yes	46.1%	47.4%			
Personal Knowledge	(n=1082)	(n=169)	.151	1	.698
No	65.4%	63.9%			
Yes	34.6%	36.1%			
Factual Knowledge	(n=903)	(n=143)	1.629	1	.202
No	28.3%	33.6%			
Yes	71.7%	66.4%			
Behavior Change	(n=1043)	(n=159)	8.901	1	.003
No	60.3%	47.8%			
Yes	39.7%	52.2%			
HIV Awareness Index	(n=1089)	(n=171)	1.987	2	.370
low	26.1%	21.1%			
moderate	50.2%	53.2%			
high	23.7%	25.7%			

A majority of heterosexual male respondents in this study reported intention to share information about their status with their partners if they were HIV+ whether they perceived themselves at risk for HIV infection or not. Of note, however, was that a larger percentage of those who perceived themselves at 'some' or 'great' risk for HIV were more likely to not tell their partner if they were HIV+ (see Table 14). The actual HIV status of participants was not collected in the primary research and hence was not available for analysis.

Table 14: HIV Attitudinal Characteristics by Perceived HIV Risk

Characteristics	Perceived HIV Risk		X^2	df	Sig.
	No	Yes			
Tell HIV+ Status	(n=1065)	(n=162)	9.378	1	.002
No	9.4%	17.3%			
Yes	90.6%	82.7%			
Condom Efficient	(n=1089)	(n=171)	1.772	2	.412
No	36.9%	39.2%			
Yes	46.2%	48.0%			
Don't Know	16.9%	12.9%			

Behavioral Characteristics

Males who had higher HIV Risk perception were more likely to have multiple sexual partners, more likely to use condoms, and less likely to attend religious services regularly (see Table 15). Nevertheless, of the 900 respondents who perceived little or no HIV risk, 83 (9%) had multiple partners. In addition, of the 169 who perceived themselves at some or great risk for HIV, 102 (60%) did not use condom at their last sexual intercourse experience.

Table 15:Behavior Characteristics by Perceived HIV Risk

Characteristics	Perceived HIV Risk		X^2	df	Sig.
	No	Yes			
Regular Attendance	(n=961)	(n=150)	3.891	1	.049
No	54.7%	63.3%			
Yes	45.3%	36.7%			
Multiple Partners	(n=900)	(n=139)	50.141	1	.000
No	90.8%	69.8%			
Yes	9.2%	30.2%			
Binge Drink	(n=992)	(n=159)	.033	1	.856
No	59.9%	59.1%			
Yes	40.1%	40.9%			
Heavy Drink	(n=991)	(n=159)	2.498	1	.114
No	79.7%	74.2%			
Yes	20.3%	25.8%			
Drug Use	(n=1086)	(n=171)	3.173	1	.075
No	93.7%	90.1%			
Yes	6.3%	9.9%			
Condom Use	(n=1084)	(n=169)	24.219	1	.000
No	77.9%	60.4%			
Yes	22.1%	39.6%			

Bivariate Associations with Multiple Partners

One factor that was identified in the research literature as strongly associated with risk for HIV infection was having multiple sexual partners. A bivariate analysis of having multiple partners and all other variables was conducted to determine which variables had strong associations for the heterosexual males in the study sample.

Biopsychosocial Characteristics

Having multiple partners was significantly associated with age, ethnicity, and cohabiting status (See table 16). Heterosexual males who reported having multiple partners were more likely to be under age 35, Black or non cohabiting. Of particular note was that of those 101 heterosexual males who reported having multiple sexual partners, 65 were cohabiting.

Table 16: Biopsychosocial Characteristics by Multiple Partners

Characteristics	Multiple Partners		X^2	df	Sig.
	NO	YES			
Age	(n=987)	(n=130)	32.440	4	.000
18-24	14.6%	32.3%			
25-34	33.3%	33.1%			
35-44	28.0%	23.1%			
45-54	13.6%	9.2%			
≥55	10.5%	2.3%			
Ethnicity	(n=971)	(n=127)	32.404	3	.000
Black	30.1%	53.5%			
Mestizo	55.1%	38.6%			
Maya	10.3%	2.4%			
Other	4.5%	5.5%			
Religion	(n=983)	(n=129)	5.116	2	.077
Catholic	55.4%	54.3%			
Other	35.2%	30.2%			
None	9.4%	15.5%			
Education	(n=984)	(n=130)	4.315	2	.116
Post-Primary	28.0%	21.5%			
Primary	44.5%	53.8%			
None	27.4%	24.6%			
Cohabiting Status	(n=911)	(n=101)	63.640	1	.000
Not cohabiting	8.9%	35.6%			
Cohabiting	91.1%	64.4%			
Childhood Abuse	(n=981)	(n=129)	.034	1	.853
Yes	8.1%	8.5%			
No	91.9%	91.5%			

Attitudinal and Awareness Characteristics

The only Benevolent Machismo Attitude Index characteristic statistically associated with having multiple partners was non-violence to women . Heterosexual males who reported having multiple partners were more likely to also more likely to indicate an attitude of violence towards women (see Table 17).

Table 17: BMAI and Attitudinal Characteristics by Multiple Partners

Characteristics	Multiple Partners		X^2	df	Sig.
	No	Yes			
Mutual Decision-making	(n=951)	(n=129)	.593	1	.441
No	27.2%	24.0%			
Yes	72.8%	76.0%			
Non-stereotype Opinion	(n=963)	(n=128)	.412	1	.521
No	49.3%	52.3%			
Yes	50.7%	47.7%			
Non-violence to Women	(n=945)	(n=127)	12.567	1	.000
No	30.1%	45.7%			
Yes	69.9%	54.3%			
Benevolent Machismo Index	(n=986)	(n=130)	5.051	2	.080
Low	28.0%	33.8%			
Moderate	42.9%	46.2%			
High	29.1%	20.0%			

Having multiple partners was also was associated with HIV transmission knowledge, knowledge of HIV positive person, and behavior change (see Table 18).

Table 18: HIV Awareness Index and Characteristics by Multiple Partners

Characteristics	Multiple Partners		X^2	df	Sig.
	No	Yes			
Transmission Knowledge	(n=930)	(n=125)	4.507	1	.034
No	37.7%	28.0%			
Yes	62.3%	72.0%			
Avoid Infection Knowledge	(n=942)	(n=125)	2.604	1	.107
No	52.3%	60.0%			
Yes	47.7%	40.0%			
Personal Knowledge	(n=933)	(n=125)	6.908	1	.009
No	66.3%	54.4%			
Yes	33.7%	45.6%			

Characteristics	Multiple Partners		X^2	df	Sig.
	No	Yes			
Factual Knowledge	(n=792)	(n=116)	.248	1	.619
No	28.8%	31.0%			
Yes	71.2%	69.0%			
Behavior Change	(n=944)	(n=120)	7.619	1	.006
No	61.4%	48.3%			
Yes	38.6%	51.7%			
HIV Awareness Index	(n=987)	(n=130)	5.672	2	.059
low	28.5%	19.2%			
moderate	48.5%	51.5%			
high	23.0%	29.2%			

Significant associations also occurred with several other attitudinal variables (see Table 19). Males who reported having multiple partners were more likely to view condoms as efficient in preventing HIV, more likely to perceive them selves at risk for HIV, but less likely to tell their partners their HIV status if they knew they were HIV+. Although relatively few males in the sample had multiple partners, 83 did not perceive themselves at risk for HIV, and 26 would not tell their partners if they were HIV positive.

Table 19: HIV Attitudinal Characteristics by Multiple Partners

Characteristics	Multiple Partners		X^2	df	Sig.
	No	Yes			
Tell HIV+ Status	(n=923)	(n=119)	17.693	1	.000
No	9.2%	21.8%			
Yes	90.8%	78.2%			
Condom Efficient	(n=943)	(n=125)	12.871	2	.002
No	38.3%	31.2%			
Yes	45.8%	61.6%			
Don't Know	15.9%	7.2%			
Perceived HIV Risk	(n=914)	(n=125)	50.141	1	.000
No	89.4%	66.4%			
Yes	10.6%	33.6%			

Behavioral Characteristics

Having multiple partners was highly significant for all of the behavioral characteristics, and was associated with more likelihood of binge drinking, heavy drinking, drug use and condom use, and less regular attendance at religious services. (see Table 20). Although respondents with multiple partners were more likely to use condoms than those who were monogamous, 60 (42%) of the 130, who reported having multiple partners, did not use condoms.

Table 20: Behavioral Characteristics by Multiple Partners

Characteristics	Multiple Partners		X^2	df	Sig.
	No	Yes			
Regular Attendance	(n=883)	(n=109)	21.547	1	.000
No	51.8%	75.2%			
Yes	48.2%	24.8%			
Binge Drink	(n=908)	(n=115)	15.544	1	.000
No	60.1%	40.9%			
Yes	39.9%	59.1%			
Heavy Drink	(n=907)	(n=115)	13.790	1	.000
No	79.6%	64.3%			
Yes	20.4%	35.7%			
Drug Use	(n=984)	(n=130)	34.084	1	.000
No	95.0%	81.5%			
Yes	5.0%	18.5%			
Condom Use	(n=980)	(n=130)	86.233	1	.000
No	79.2%	41.5%			
Yes	20.8%	58.5%			

Associations with Condom Use among Respondents Reporting Multiple Partners

Having multiple sexual partners, perhaps, was the most clearly delineated risk factor within this study sample. Thus finding associations with condom use among this sub-group was particularly relevant to health policy.

Biopsychosocial Characteristics

Among those who did have multiple partners, condom use was only significantly associated with the biopsychosocial characteristic cohabiting status (see Table 21). These condom users were more than twice as likely to be single as non-condom users who had multiple sexual partners. Of the 40 male respondents who were not using condoms, 32 (80%) were cohabiting.

Table 21: Condom Use by Biopsychosocial Characteristics among Respondents with Multiple Partners

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Age	(n=54)	(n=76)	2.831	4	.587
18-24	25.9%	36.8%			
25-34	33.3%	32.9%			
35-44	27.8%	19.7%			
45-54	9.3%	9.2%			
≥55	3.7%	1.3%			
Ethnicity	(n=54)	(n=73)	3.643	3	.303
Black	46.3%	58.9%			
Mestizo	46.3%	32.9%			
Maya	3.7%	1.4%			
Other	3.7%	6.8%			
Religion	(n=54)	(n=75)	.655	2	.721
Catholic	51.9%	56.0%			
Other	29.6%	30.7%			
None	18.5%	13.3%			
Education	(n=54)	(n=76)	2.932	2	.231
Primary	55.6%	52.6%			
Post Primary	14.8%	26.3%			
None	29.6%	21.1%			
Cohabiting Status	(n=40)	(n=61)	7.066	1	.008
Cohabiting	80.0%	54.1%			
Not Cohabiting	20.0%	45.9%			
Childhood Abuse	(n=53)	(n=76)	.900	1	.343
No	88.7%	93.4%			
Yes	11.3%	6.6%			

Attitudinal and Awareness Characteristics

Among those who did report having multiple sexual partners, condom use was not significantly associated with any variable related to benevolent machismo (see Table 22).

Table 22: Condom Use by Benevolent Machismo Index, attitudinal factors among Respondents with Multiple Partners

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Mutual decision making	(n=53)	(n=76)	.012	1	.912
No	24.5%	23.7%			
Yes	75.5%	76.3%			
Non-stereotype Opinion	(n=53)	(n=75)	.204	1	.651
No	54.7%	50.7%			
Yes	45.3%	49.3%			
Non-violence to Women	(n=52)	(n=75)	2.959	1	.085
No	36.5%	52.0%			
Yes	63.5%	48.0%			
Benevolent Machismo	(n=54)	(n=76)	.381	2	.827
Index	31.5%	35.5%			
Low	46.3%	46.1%			
Moderate	22.2%	18.4%			
High					

Condom use was not significantly associated with any variable related to HIV Awareness among those who reported having multiple sexual partners (see Table 23).

Table 23:Condom Use by HIV Awareness Index, awareness characteristics among Respondents with Multiple Partners

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Transmission Knowledge	(n=50)	(n=75)	.165	1	.684
No	26.0%	29.3%			
Yes	74.0%	70.7%			
Avoid Infection	(n=50)	(n=75)	.139	1	.709
Knowledge	58.0%	61.3%			
No	42.0%	38.7%			
Yes					
Personal Knowledge	(n=50)	(n=75)	.435	1	.509
No	58.0%	52.0%			
Yes	42.0%	48.0%			

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Factual Knowledge	(n=46)	(n=70)	.088	1	.766
No	32.6%	30.0%			
Yes	67.4%	70.0%			
Behavior change	(n=50)	(n=70)	1.102	1	.294
No	54.0%	44.3%			
Yes	46.0%	55.7%			
HIV Awareness Index	(n=54)	(n=76)	1.624	2	.444
Low	24.1%	15.8%			
Moderate	46.3%	55.3%			
High	24.1%	28.9%			

There was statistical significance for condom use and belief that condoms were efficient in preventing HIV transmission (see Table 24). In this case, condom users who reported having multiple sexual partners were more likely to believe in condom efficiency than non-condom users who reported having multiple sexual partners. Of particular note was that as many as 25% of heterosexual males who reported using condoms did not believe condoms were efficient in preventing the transmission of HIV infection. Conversely, 40% of respondents who did use condoms did not believe they were efficient.

Table 24: HIV Attitudinal Characteristics among Respondents with Multiple Partners

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Tell HIV+ Status	(n=48)	(n=71)	2.487	1	.115
No	14.6%	26.8%			
Yes	85.4%	73.2%			
Condom Efficient	(n=50)	(n=75)	10.712	2	.005
No	40.0%	25.3%			
Yes	46.0%	72.0%			
Don't Know	14.0%	2.7%			
HIV Risk Perceived	(n=50)	(n=75)	.006	1	.938
No	66.0%	66.7%			
Yes	34.0%	33.3%			

Behavioral Characteristics

Only one behavioral variable was significantly associated with condom use (see Table 25). Condom users who reported having multiple sex partners were more likely to binge drink than non condom users who reported having multiple partners.

Table 25: Condom Use by Behavioral Characteristics and Multiple Partners

Characteristics	Condom Use		X^2	df	Sig.
	No	Yes			
Regular Attendance	(n=44)	(n=65)	.903	1	.342
No	70.5%	78.5%			
Yes	29.5%	21.5%			
Binge Drink	(n=48)	(n=67)	4.287	1	.038
No	52.1%	32.8%			
Yes	47.9%	67.2%			
Heavy Drink	(n=48)	(n=67)	.193	1	.660
No	66.7%	62.7%			
Yes	33.3%	37.3%			
Drug Use	(n=54)	(n=76)	1.855	1	.173
No	87.0%	77.6%			
Yes	13.0%	22.4%			

Logistic Regression Analysis

To find out whether bivariate associations were independent or interacting with each other, logistic regression models were performed for both dependent variables as well as the high risk factor having multiple partners. The results identified factors that independently predicted condom use, perceived HIV risk as well as having multiple partners.

Variables Predicting Condom Use

Block 1 of a logistic regression analysis entered into the model all biopsychosocial factors that were significant at the $p \leq .25$ level in bivariate associations. Condom use was predicted by younger age, non cohabitation status, having post-primary education, and not being Mestizo or Maya (see Table 26).

After controlling for biopsychosocial factors, attitudinal and awareness characteristics were entered forward conditionally in Block 2 of the logistic regression analysis. Attitudinal characteristics that predicted condom use included intention to tell HIV+ status (OR = .437) and belief that condoms were efficient in preventing HIV transmission (OR = 2.212). The odds of respondents using condoms were lower among

respondents would tell their partners of their status HIV+ status. The odds of respondents using condoms were greater, however, if respondents believed condoms were efficient in preventing HIV transmission.

Block 3 of the logistic regression analysis forward conditionally entered all behavioral factors that were significant at the $p \leq .25$ level in the bivariate associations into the logistic regression model. Behavioral characteristics that were predictive of condom use were having multiple partners (OR = 3.652) and binge drinking (OR = 1.850). The attitudinal characteristic, tell HIV+ status, was no longer significantly associated with condom use. Psychosocial factors that were predictive of condom use in the first model of the logistic regression continued to be predictive even when attitudinal and behavioral factors were entered conditionally.

Table 26: Logistic Regression Analysis Predicting Condom Use (N=571)

	B	S.E.	Wald	df	Sig.	Exp(B)
Block 1						
Age	-.048	.011	18.802	1	.000	.953
Ethnicity			12.720	3	.005	
Black	-.495	.454	1.190	1	.275	.610
Mestizo	-1.216	.467	6.785	1	.009	.296
Maya	-1.419	.663	4.576	1	.032	.242
Catholic	.249	.238	1.094	1	.296	1.283
Not Cohabiting	1.808	.308	34.366	1	.000	6.098
Education			10.597	2	.005	
Post Primary	.677	.318	4.538	1	.033	1.967
Primary	-.061	.316	.038	1	.846	.940
Block 2						
Age	-.049	.011	18.953	1	.000	.952
Ethnicity			13.541	3	.004	
Black	-.538	.460	1.368	1	.242	.584
Mestizo	-1.300	.474	7.506	1	.006	.273
Maya	-1.452	.677	4.602	1	.032	.234
Catholic	.178	.243	.533	1	.456	1.194
Not Cohabiting	1.763	.313	31.755	1	.000	5.828
Education			9.577	2	.008	
Post Primary	.702	.328	4.572	1	.033	2.017
Primary	-.008	.324	.001	1	.980	.992
Tell HIV Status	-.827	.383	4.653	1	.031	.437

	B	S.E.	Wald	df	Sig.	Exp(B)
Condom Efficient	.794	.225	12.475	1	.000	2.212
Block 3						
Age	-.044	.012	14.714	1	.000	.957
Ethnicity			11.726	3	.008	
Black	-.670	.464	2.082	1	.149	.512
Mestizo	-1.350	.484	7.788	1	.005	.259
Maya	-1.550	.700	4.908	1	.027	.212
Catholic	-.017	.259	.004	1	.948	.983
Not Cohabiting	1.676	.322	27.028	1	.000	5.345
Education			12.781	2	.002	
Post Primary	.819	.344	5.673	1	.017	2.268
Primary	-.027	.342	.006	1	.937	.973
Tell HIV Status	-.703	.409	2.953	1	.086	.495
Condom Efficient	.728	.230	10.030	1	.002	2.071
Multiple Partners	1.295	.350	13.732	1	.000	3.652
Binge Drink	.615	.240	6.602	1	.010	1.850

Cox & Snell R^2 = .208 for Block 1; ΔR^2 = .231 for Block 2; ΔR^2 = .259 for Block 3

Variables Predicting Perceived HIV Risk

Block 1 of a logistic regression analysis entered all biopsychosocial factors that were significant at the <.25 level in bivariate associations into the model. The dependent variable perceived HIV risk was not predicted by any biopsychosocial characteristic (see Table 27). After controlling for biopsychosocial factors, attitudinal and awareness characteristics were entered forward conditionally in Block 2 of the logistic regression analysis. Only one attitudinal characteristic, HIV transmission knowledge (OR = 2.779), predicted perceived HIV risk. Those who had knowledge of how HIV was transmitted had higher odds of perceiving risk for HIV infection. Block 3 of the logistic regression analysis forward conditionally entered all behavioral factors that were significant at the <.25 level in bivariate associations into the model. Having multiple partners (OR = 3.794) was the only behavioral characteristic that predicted perceived HIV risk. While no biopsychosocial variable predicted perception of HIV risk the attitudinal variable HIV transmission knowledge continued to be significantly associated with perceived risk.

Table 27: Logistic Regression Analysis Predicting Perceived HIV Risk (N=571)

	B	S.E.	Wald	df	Sig.	Exp(B)
Block 1						
Age	-.013	.013	1.029	1	.310	.987
Ethnicity			5.231	3	.156	
Black	.681	.767	.787	1	.375	1.975
Mestizo	.096	.778	.015	1	.902	1.100
Maya	.851	.881	.933	1	.334	2.342
Catholic	.457	.292	2.453	1	.117	1.579
Not Cohabiting	.588	.360	2.668	1	.102	1.800
Education			1.963	2	.375	
Post Primary	-.380	.368	1.065	1	.302	.684
Primary	-.482	.348	1.925	1	.165	.617
Block 2						
Age	-.013	.013	.940	1	.332	.988
Ethnicity			5.655	3	.130	
Black	.581	.773	.563	1	.453	1.787
Mestizo	.030	.781	.001	1	.970	1.030
Maya	.980	.892	1.209	1	.272	2.665
Catholic	.507	.294	2.978	1	.084	1.661
Not Cohabiting	.574	.362	2.518	1	.113	1.776
Education			2.752	2	.253	
Post Primary	-.586	.377	2.414	1	.120	.556
Primary	-.505	.352	2.060	1	.151	.603
HIV Transmission Knowledge	1.022	.347	8.680	1	.003	2.779
Block 3						
Age	-.009	.013	.482	1	.487	.991
Ethnicity			4.339	3	.227	
Black	.622	.789	.620	1	.431	1.862
Mestizo	.232	.798	.084	1	.772	1.261
Maya	1.168	.913	1.636	1	.201	3.214
Catholic	.480	.300	2.561	1	.110	1.616
Not Cohabiting	.349	.377	.857	1	.355	1.417
Education			2.042	2	.360	
Post Primary	-.431	.384	1.256	1	.262	.650

	B	S.E.	Wald	df	Sig.	Exp(B)
Primary	-.503	.360	1.949	1	.163	.605
HIV Transmission Knowledge	.996	.350	8.109	1	.004	2.708
Multiple Partners	1.334	.353	14.254	1	.000	3.794

Cox & Snell R^2 = .026 for Block 1; ΔR^2 = .043 for Block 2; ΔR^2 = .064 for Block 3

Variables Predicting Multiple Partners

Block 1 of a logistic regression analysis entered all biopsychosocial factors that were significant at the <.25 level in bivariate associations into the model. Having multiple sexual partners was predicted by only one biopsychosocial factor: cohabiting status (see Table 28). After controlling for biopsychosocial factors, attitudinal and awareness characteristics were entered forward conditionally in Block 2 of the logistic regression analysis. Four attitudinal characteristics predicted having multiple partners. The odds were greater that respondents with multiple partners were believed condoms were efficient in preventing HIV infection (OR = 1.989) or perceived themselves at risk for HIV (OR = 4.043). The odds were lower that respondents with multiple partners had non stereotypical opinions about women (OR = .473) or intended to tell their partners if they were HIV+ (OR = .392).

Block 3 of the logistic regression analysis forward conditionally entered all behavioral factors that were significant at the $p \leq .25$ level in bivariate associations into the model. Condom use (OR = 3.632) was the only behavioral characteristic that predicted having multiple sexual partners. Two of the 4 attitudinal variables no longer continued to be predictive of having multiple partners: belief that condoms were efficient in preventing HIV infection and intention to tell partners of their status if HIV+. None of three biopsychosocial variables continued to be predictive of having multiple partners.

Table 28: Logistic Regression Analysis Predicting Multiple Partners (N=571)

	B	S.E.	Wald	df	Sig.	Exp(B)
Block 1						
Age	-.024	.015	2.627	1	.105	.976
Ethnicity			9.616	3	.022	
Black	.150	.658	.052	1	.819	1.162
Mestizo	-.914	.690	1.755	1	.785	.401
Maya	-.869	.978	.789	1	.374	.420
Catholic	.291	.317	.841	1	.359	1.337
Not Cohabiting	1.144	.367	9.722	1	.002	3.141
Education			5.204	2	.074	

	B	S.E.	Wald	df	Sig.	Exp(B)
Post Primary	-.986	.452	4.761	1	.029	.373
Primary	-.367	.3951	.864	1	.353	.693
Block 2						
Age	-.023	.015	2.255	1	.133	.978
Ethnicity			10.330	3	.016	
Black	-.109	.680	.026	1	.873	.897
Mestizo	-1.207	.712	2.873	1	.090	.299
Maya	-1.602	1.055	2.308	1	.129	.201
Catholic	.178	.333	.285	1	.593	1.195
Not Cohabiting	1.026	.378	7.376	1	.007	2.789
Education			2.480	2	.289	
Post Primary	-.667	.490	1.854	1	.173	.513
Primary	-.132	.425	.097	1	.756	.876
Non Stereotype Opinion	-.748	.321	5.447	1	.020	.473
No Violence to Women	-.643	.329	3.825	1	.051	.526
Perceived HIV Risk	1.397	.361	14.936	1	.000	4.043
Condom Efficient	.688	.326	4.463	1	.035	1.989
Tell HIV+ Status	-.937	.443	4.478	1	.034	.392
Block 3						
Age	-.011	.016	.459	1	.498	.989
Ethnicity			7.612	3	.055	
Black	.062	.697	.008	1	.929	1.064
Mestizo	-.941	.730	1.662	1	.197	.390
Maya	-1.159	1.071	1.171	1	.279	.314
Catholic	.123	.343	.129	1	.719	1.131
Not Cohabiting	.611	.398	2.360	1	.124	1.842
Education			3.361	2	.186	
Post Primary	-.771	.496	2.417	1	.120	.462
Primary	-.136	.439	.095	1	.757	.873
Non Stereotype Opinion	-.782	.329	5.655	1	.017	.457
No Violence to Women	-.604	.337	3.216	1	.073	.547
Perceived HIV Risk	1.392	.374	13.880	1	.000	4.024
Condom Efficient	.481	.337	2.038	1	.153	1.618
Tell HIV+ Status	-.733	.460	2.540	1	.111	.480

	B	S.E.	Wald	df	Sig.	Exp(B)
Condom Use	1.290	.364	12.532	1	.000	3.632

Cox & Snell R^2 = .060 for Block 1; ΔR^2 = .114 for Block 2; ΔR^2 = .133 for Block 3

CHAPTER V: DISCUSSION

Introduction

While the ethnic distribution in the sample closely approximated the general population, an unexpected finding was that the median age for respondents was 35. The median age of the 1999 male population was in the 15-19 age group (SIB, 1999). According to the literature presented in Chapter 2, the population at greatest risk for contracting HIV were those who were 25 years of age or younger. The fact that the subjects represented a more mature age group may account for some of the findings reported. For example, a majority were married or living together. Cohabitation would suggest maturity in sexual relationships, particularly if respondents were of older age.

This 'older' age in the study sample reflected a sampling bias that may have affected the results. Although a probability sampling strategy had been used in identifying the survey households, respondent selection within households may not have been skewed with respect to age. Generalization of these findings for the entire male population in Belize would not be recommended given the possibility that the sample in this study is not representative, at least according to age.

Almost 16% of the respondents did not respond to the question on cohabitation. If this non-response was indicative of 'single' habitation status, then over 26% of respondents would be 'single', rather than the reported 10.8%. The size of the non-response category for this particular variable could affect the confidence of the findings, potentially leading to an under-reporting of respondents who were single. Bivariate or multivariate analysis could be spurious because of the large amount of missing data, particularly if non-responders were atypical with regard to the dependent variables.

Analysis of the Benevolent Machismo Attitude Index (BMAI) revealed that over 70% had moderate to high ratings on a scale of low, moderate or high scores. There appeared to be a normal distribution on the BMAI scale with the largest group (42.7%) of respondents falling into a moderate range. The remaining respondents were equally divided on the extreme end of the scale (i.e., 28.6% on both "High" and "Low" ratings). Closer examination of the variables making up the BMAI, found, however, that a strong majority of respondents described positive attitudes related to "Mutual Decision Making" (69.4%) and "Non-Violence to Women" (65.8%). On the other hand, *non-stereotypical opinions about women* was fairly even in its distribution between support for and lack of support for these attitudes.

What this meant was that a large majority of respondents believed men and women should decide together about how many children they should or whether they should and what contraceptive to use. The BMAI findings also meant that a large majority reported the same age as the most appropriate age for first sexual intercourse experience for both men and women; reported the same treatment towards boys and girls as the most appropriate way to be treated in schools as a result of teen pregnancy; and reported as untruths traditionally held beliefs about women's sexual purity and men's promiscuity. These findings appeared to support the Villereal and Cavazos (2005) definition of benevolent machismo as a positive attitude towards women and families.

Results for the HIV Awareness Index (HAI) also suggested a normal distribution, with 47.6% of those who responded having "moderate" levels of awareness. Levels that were "low" (29.8%) and "high" (22.7%) remained relatively close. Over 70% had a moderate to high HAI score.

Even with these higher awareness scores, a majority did not indicate substantial knowledge or awareness on 3 of the 5 measures in the HIV Awareness Index: 1) low knowledge of how to avoid HIV (51%), 2) no personal knowledge of an HIV+ person (61.5%), or 3) low awareness leading to behavior change since learning about HIV (58.1%). Although 57.6% of respondents had a score that indicated they had knowledge of HIV transmission, only 43.8% had scores that indicated they knew how to avoid HIV infection.

Scoring for the BMAI and the HIV Awareness Index (HAI) used different paradigms and a logical framework. The scoring, however, was arbitrary. Two of the questions used in determining HAI appeared to be measuring the same thing. Of concern was that there were almost 20% of the respondents that did not respond to questions related to factual knowledge.

If the non-response was indicative of a lack of HIV awareness, then over 44% of the respondents lacked sufficient awareness of HIV risk. The size of the non-response category for this particular index affected the confidence of the findings, potentially leading to an under-reporting of lack of knowledge. Other data that could have potential benefit in understanding the discrepancy between knowledge of HIV and avoidance strategies were from responses to the question related to perceived HIV risk.

Almost 80% of respondents did not perceive themselves to be at risk for HIV infection. It was possible that, given a majority of respondents reported being 35 or older and more likely to be in a monogamous relationship, their maturity may have contributed to their sense of safety. This sense of "safety" may have inhibited their openness to learning about how to avoid contacting the illness. Respondents who were 35 or older at the time of the study would have been outside the age group targeted for HIV education at the time HIV education programs began.

Another indication of perceived risk was revealed in the reported use of condoms. A slight majority (51.3%) did not believe or did not know if condoms were efficient in preventing HIV. Lack of knowledge and understanding about HIV/AIDS could lead to misconceptions about possible HIV risk. The findings on both perceived risk and condom use suggested further attention may be needed in how the health promotion and health education agendas are structured. The differential impact these may have on subgroups within the Belize male population also would need further attention. The data generated in the primary research did not facilitate examination of this issue. More in-depth research may help to understand if and how a disconnection may be occurring in the HIV risk reduction and prevention information disseminated in Belize.

Another way to measure attitude about HIV/AIDS awareness and knowledge was to examine people's willingness to share their HIV status. A large majority of respondents (82%) reported they would tell their partners their status if they were HIV+. While there are a variety of factors beyond knowledge that could influence one's decision to share this information, the findings reported could be an indication of an individual's awareness of HIV transmission. It could also be a reflection of a

positive attitude toward the female partner, since the focus of this research was on heterosexual relationships.

Another plausible explanation was that the "political correctness" factor could have influenced the responses. Public health laws encourage and often mandate the sharing of HIV+ information. Therefore, a positive response to this question may have more to do with what respondents believed they "should" answer. Nevertheless, there still remained a substantial percentage (18%) of sexually active males who would not tell their partners or would not state whether they would tell HIV status.

The analysis of behavior factors associated with HIV risk, as identified in the research literature, revealed a large percentage of respondents who did not engage in risky behaviors. Of the five measures of behavior, the two that were reported by less than 10% of the sample were multiple partners and drug use. Respondents were most likely to describe binge drinking patterns (35.9%) from among three substance use variables included in the analysis. The small percentage of respondents who reported having multiple partners was particularly important because of the potential risk for HIV infection.

While the rate of having multiple partners was low, the percentage of missing data (almost 20%) weakened the confidence in this finding. For example, this 20% could have been dominated by individuals who had multiple sexual partners but were unwilling to admit to this behavior. The unwillingness to report could have been because of the sensitive nature of the information and the interviewing conditions. Respondents were interviewed in their homes where, potentially, other family members may have been present. The under-reporting on this variable could have produced spurious findings, particularly as the analysis progressed to bivariate and multivariate levels.

The high percentage of missing data for the variable multiple partners was of concern as noted. Of even greater concern was the limited use of condoms. Over three-fourths of the respondents reported they were not using condoms at the time of the survey. The high percentage of monogamous relationships and ensuing perceptions of low risk may have accounted for this response. Monogamy in a current relationship, however, would not eliminate the risk for HIV exposure.

The perceived safety of a monogamous relationship would be dependent on no previous exposure. Exposure to HIV/AIDS could have occurred prior to the monogamous relationship. Unfortunately, there was no way, from the data in this study, to determine how long the respondent was monogamous , nor was there any objective measure of HIV status (i.e., blood tests) to validate the participant's real level of safety in sexual contact. The data only addressed sexual contact within the past 3 months.

Perceived safety of a monogamous relationship would also be dependent on no engagement in extramarital affairs by the partner during the relationship. No national data on extra marital affairs in Belize could be found. There was no reason to believe that this would be lower than the 50% rates reported in the United States. If true, the heterosexual males have no way of knowing if their partners were exposed prior to or during their relationships.

Condom Use

Chi-Square analysis resulted in 4 demographic variables that were significantly associated with condom use at the p = ≤.05 level. These were namely: age, ethnicity, cohabitation status, and education. Findings from a multivariate analysis also found all these variables to be predictive of condom use.

While condom use was low overall, greater use was more likely to occur up to age 34, and then quickly declined for men 35 and older (x^2=120.258, n = 1366, df = 4, p=.000). Condom users were 3 times more likely to be in the youngest age group than non condom users. This finding also occurred in the multivariate analysis with younger age being predictive of condom use (OR=.957; p =.000). Findings for age at both analysis levels supported empirical research concluding condom use was more likely to occur among younger men (Campbell, 1995; Whitehead, 2001).

Ethnicity was predictive of condom use in the multivariate analysis where the odds were lower that Mestizo (OR = .259) or Mayan (OR = .212) respondents used condoms. There was no statistical significance with Black ethnicity. This was different from the finding in the bivariate analysis where respondents of Black ethnicity were more likely to use condoms than other groups (x^2=50.265, n=1337, df = 3, p=.000).

Perhaps what has been suggested was that, controlling for other factors, condom use was most likely to be used by respondents who identified as Creole, Garifuna, or Africans. It would further suggest an opportunity that could be capitalized on by public health officials in their condom use promotion and education campaigns regardless of what the primary purpose was for condom use. The finding for statistical association with the education variable would be helpful in this process in identifying opportunities and constraints for several target groups.

It was not surprising that education would be significantly associated with condom use in the bivariate analysis (x^2=73.742, n=1363, df = 2, p=.000) given the results of numerous empirical research findings in various cultures and countries. Respondents with post primary education were more likely to use condoms than respondents who had no formal education or those who had only completed primary (elementary) school. The finding from the bivariate analysis was supported in the multivariate analysis where the odds were greater that respondents had completed post primary education (OR = 2.268; p = .017). The public health literature was replete with studies that documented the relationship between increased education and health prevention behaviors. These findings supported the hypothesis that increased education plays an important role in predicting condom use.

Findings from the bivariate and multivariate analyses also supported the hypothesis of a relationship between cohabitation status and condom use. Cohabitation was significantly associated (x^2=153.314, n = 1,149, df = 1, p=.000) with condom use. If a respondent was using condoms he was 5 or more times more likely to be single than if he was not using condoms. This finding from the bivariate analysis was supported in the multivariate analysis where the odds were greater that respondents were single (OR = 5.345; p = .000). The findings also highlighted a potential risk for HIV infection for several respondents. There were sexually active individuals who reported being single but were not using condoms.

Chi-Square analysis resulted in 7 attitudinal and awareness variables that were significantly associated with condom use at the p = ≤.05 level. These were namely: having non-stereotype opinion, awareness that led to behavior change, benevolent machismo attitude, belief that condoms were efficient in preventing HIV transmission, intention to tell their status if they were HIV+ and perception they were at some or great risk for HIV infection.

Condom users were more likely to hold more egalitarian views of women (non-stereotype opinion (x^2=5.227, n=1,327, df-1, p-.022) than non condom users. This was the only variable related to the Benevolent Machismo Attitude Index (BMAI) that had any statistical significance. Determining meaning from this data was difficult. One could suggest that a more egalitarian attitude about women could influence the partners' belief that the women were equally likely to have had multiple partners in the past. It could also reflect a sense of respect for the woman by using condom for her protection. Future research is needed to explore in more depth the relationship between males' non-stereotypical opinions of women and risk behaviors for sexually transmitted diseases, including HIV infection.

The HIV Awareness Index was significantly associated (x^2=33.896, n=1,366, df=2, p=.000) with condom use, as were 2 of the 5 factors in the HAI: 1) knowledge of HIV transmission and 2) awareness leading to behavior change since learning about HIV. While condom use was generally low overall, it was more likely to occur in respondents who scored in the moderate to high range on the HAI. Those who used condoms were about 1.5 times more likely to score "high" on the HAI than non condom users. The difference between those who had low awareness was even greater. Non condom users were almost twice as likely to score low on the HAI.

On examining the individual factors that contributed to the HAI, two were found to be significantly associated with condom use. Respondents reporting they knew how HIV was transmitted were more likely to use condoms (x^2=12.636, n=1,279, df=1, p=.000). An awareness leading to behavior change since learning about HIV was also more likely among those who reported using condoms (x^2=27.890, n=1,302, df=1, p=.000). These findings were supported in the bivariate analysis of knowledge of how to avoid HIV infection. While this latter factor was only approaching significance, the finding that condom users were slightly more likely to report knowledge of how to avoid HIV infection (x^2=3.116, n=1,1295, df=1, p=.078) bolstered the findings for the previous two attitudinal variables.

This would certainly be supportive of public health officials' work in Belize in mounting health education on HIV awareness. Given the large numbers of respondents who scored low on the HAI or 'no' on the individual factors comprising the index, much work would need to be done to ensure a broader reach in health promotion and health education activities related to HIV risk.

An important finding to remember was that 75% of the respondents were not using condoms. As discussed earlier, it was possible that, given a majority of older respondents being more likely to be in monogamous relationships, age may have contributed to their sense of safety. Condom use by those reporting HIV awareness was further supported by variables examining condom efficiency and perceived risk for HIV.

There was a significant relationship between condom use and belief that condoms were efficient in preventing HIV infection (x^2=72.090, n=1,296, df=2, p=.000). Condom users were more likely to have this belief. Over 62% of respondents who used condoms believed they were efficient in preventing HIV transmission. Non condom users were more than 7 times more likely to report they did not know if condoms were efficient in preventing HIV infection than condom users. This finding may, in part, be a reflection of complete lack of knowledge about the benefits of condom use. However, respondents who reported they had never used condoms may not have thought there was any relevance to themselves. These are considerations that could have affected the findings.

While a lack of knowledge about condom was of concern, also of concern was that 34.1% of respondents who reported condom use did not believe condoms were efficient in preventing HIV. One plausible explanation was that respondents were not using condoms for HIV prevention purposes but for pregnancy prevention purposes. This would suggest that a lack of knowledge and understanding could increase the potential for HIV exposure if the heterosexual couple was not concerned about pregnancy (e.g., the male had a vasectomy or the woman was on birth control). However, it was also possible there was a lack of factual knowledge. This lack of awareness in time could influence perception of safety from sexually transmitted infections such as HIV.

Consistent with the HBM, the perception of risk was a major factor in an individual's motivation to engage in health behaviors. There was a significant relationship between perceived HIV risk and condom use (x^2 = 24.219, n=1,253, df = 1, p=.000). A large majority of condom users did not believe they were at risk for HIV infection. People who perceived risk were more likely to use condom. Education which helped to increase perception of risk may help to increase the use of condom. Perhaps a low perception of risk influenced non condom use behavior. This finding supported a suggestion that the use of condoms may be driven by different reasons, such as pregnancy prevention. A variable was included in the primary research as to reason for condom use. Less than 10% of the sample responded to a range of options. Despite these few responses, however, the majority acknowledged condom use for contraceptive purposes. Further research would be needed to confirm if pregnancy prevention was the primary reason for condom use for a larger percentage of respondents.

The small but significant percentage (8.2%) of missing data of the variable perceived HIV risk could suggest that the condom use findings were spurious. A major issue to be addressed by public health officials would be how to increase awareness in order to enhance appropriate perception of HIV risk among Belizean males, especially among those who engage in risky behaviors such as having multiple partners. Another attitudinal variable, tell HIV+ status was also significantly associated with condom use (x^2=5.251, n=1,259, df = 1, p=.022). A majority (85.7%). of condom users indicated they would tell their partners their status if they were seropositve. However, condom users (14.3%) were more likely than non condom users (9.7%) to not tell their HIV+ status to their partners if they were seropositve. Perhaps cohabiting condom users and or their partners were not telling but using condoms as one way to hide potential infidelity. Conversely condom users may be more engaged in casual sexual

relationships and would therefore be less likely to tell their partners of their HIV+ status.

It may be possible that HIV knowledge and awareness levels were low among those who would not tell their HIV+ status. It may also have been that respondents did not perceive of condom use in relation to HIV prevention. Respondents may have been among those who had never used condoms. A range of possible explanations may have existed to explain the relationship between intention to respondent's intention to tell his partner his status if it was HIV+ and condom use. A large number of attitudinal and awareness variables proved to have statistical significance with condom use in the bivariate analysis.

Multivariate analysis results for HIV attitudinal and awareness factors in the logistic regression analysis of condom use were different from the bivariate analysis. In the bivariate analysis of condom use there were significant associations with 7 attitude and awareness variables. Of these 7 variables only one proved to be predictive of condom use in the multivariate analysis. This was the belief that condoms were efficient in preventing HIV transmission. The odds were greater that belief that condoms were efficient in preventing HIV transmission independently predicted condom use (OR = 2.071; p = .002).

Chi-Square analysis resulted in all behavioral variables being statistically significantly associated to condom use at the $p \leq .05$ level. These included regular attendance at religious services, having multiple sexual partners, binge drinking, heavy drinking and drug use. Condom users were almost 5 times more likely than non condom users to report having multiple partners (x^2=18.248, n=1208, df =1, p=.000). Condom users were also more likely to report binge drinking (x^2=38.297, n=1248, df=1, p=.000).

A majority of condom users did not report heavy drinking and even fewer reported drug use. However, condom users were more likely than non-condom users to report these substance use behaviors (heavy drinking, x^2=31.594, n=1247, df = 1, p=.000) and (drug use, x^2 = 38.297, n=1248, df = 1, p=.000). This is counterintuitive since engagement in substance use behaviors can affect judgment negatively and the use of condom is a sign of responsible behavior. Although biospychosocial factors such as younger age or single habitation status could also have influenced these findings, binge drinking was still significantly associated for condom use after controlling for these factors in the logistic regression.

Regular attendance for religious services was used as a proxy for the influence of religion. The bivariate analysis showed significant findings in relation to condom use. Those who used condoms were less likely to attend religious services regularly (x^2=18.248, n=1208, df = 1, p=.000), while the opposite was true for those who did report regular attendance. This finding could suggest the potential for involvement of religious leaders in condom promotion and education campaigns.

All the behavioral variables had statistical significance with condom use. However, only 2 were independently predictive of condom use in a multivariate analysis. These behavior variables were having multiple partners (OR = 3.652; p = .000) and binge drinking (OR = 1.850; p = .010). In both cases the odds were greater.

To determine if these results were any different among only respondents who reported having multiple partners, a bivariate analysis was done for those respondents.

Ethnicity and education were no longer statistically significant biopsychosocial variables. There was statistical significance for habitation status. Condom users were >2 times more likely to be single (x^2=7.066, n=101, df =1, p=.008) than non condom users. Only 1 of 7 attitudinal and awareness variables continued to be statistically significant. Respondents were more likely to believe condoms were efficient in preventing HIV transmission (x^2=10.712, n=125, df = 2, p=.005). Of note, however, was that non condom users were >6 times more likely to report they did not know whether condom use was efficient or not in preventing the transmission of HIV. It may be that respondents didn't know the benefit of using condoms for HIV prevention and so did not use them. This is of importance from a public health perspective and critical to policy makers.

Perceived HIV Risk

Chi-Square analysis resulted in 4 variables that were significantly associated with perceived HIV risk at the p = ≤.05 level. These were age, ethnicity, cohabitating status, and religion. The number of variables that resulted in statistical significance for perceived risk was the same as resulted in statistical significance for condom use. Three of these biopsychosocial variables were similar. The difference was that education was no longer significant but biopsychosocial variable religion was statistically significant. A multivariate analysis to determine independently predictive biopsychosocial factors of perceived HIV risk resulted in none of the bivariate findings or any other biopsychosocial variable being predictive.

In the previous discussion there was no statistical significance between condom use and type of religion. However, religion did surface as a significant factor in perceived risk bivariate analysis (x^2=5.984, n=1,245, df =2, p=.05). This result appeared to support the hypothesis that there was a relationship between type of religion and perceived risk. While the Catholic doctrine forbidding the use of contraceptives could account for a higher perceived risk, this was not supported by the findings related to condom use. The finding was conflicting, given that a majority of Catholics were Mestizo and Mestizo respondents were less likely to perceive HIV risk than those of Black ethnicity. Being Catholic was not significant with perceived HIV risk in the logistic regression. More research is needed to better understand how religion, that is, being Catholic, (x^2=5.984, n=1,154, df = 2, p=.050) influenced perceived HIV risk.

The relationship between perceived HIV risk and habitation status was strong. Respondents who perceived risk were twice as likely to be single (non-cohabiting) than those who did not perceive HIV risk. Respondents perceiving risk were also more likely to report Black ethnicity (x^2=12.201, n=1,232, df = 3, p=.007). This may have been related to their behaviors. Findings from the bivariate analysis of condom use earlier in the discussion resulted in respondents reporting Black ethnicity to be almost 2 times as likely to report condom use.

Chi-Square analysis resulted in 2 attitudinal and awareness variables being significantly associated with perceived HIV risk at the p ≤.05 level. These were: awareness leading to behavior change and intention to tell HIV+ status to their partners. Of note was that neither the Benevolent Machismo Attitude Index nor any of the

individual factors comprising this index were statistically significantly associated with perception of HIV risk. The HIV Awareness Index was also not significant, although one factor, awareness leading to behavior change since learning about HIV, within the index revealed a significant association.

Respondents who perceived HIV risk were more likely to report awareness leading to behavior change (x^2=8.901, n=1,260, df =1, p=.003). Behavior change is a strong indicator of awareness, since it entails action rather than just perception. However, the fact that none of the other attitudinal or knowledge variables came up significant could suggest a spurious finding.

Another attitudinal/awareness variable that was significantly associated with perceived HIV risk was tell HIV+ status (x^2=9.378, n=1,227, df =1, p=.002). Respondents who perceived HIV risk were less likely to tell their partners if they were HIV+. It is plausible that this finding was affected by other confounding variables, such as a lack of benevolent machismo. The benevolent machismo attitude construct proposed a more balanced view of gender roles and behaviors and are characterized by positive attitudes towards women and families. Older age and monogamous relationships suggest biopsychosocial variables that could factor into these possible explanations.

It may also be plausible that respondents with higher perceived risk may have had more than one partner. They may have had no close relationships or connections to their multiple partners, feeling no obligation to tell of their seropositive status. However, the fact that the absolute numbers were small may have skewed the findings and that is of concern.

All the attitudinal and awareness variables were included in a multivariate analysis to show whether they were independently associated with perceived HIV risk or whether they may have been interacting with each other or other confounding factors. The only attitudinal and awareness variable that independently predicted perceived HIV risk was having HIV transmission knowledge. The odds were greater that respondents who perceived risk had knowledge of how HIV was transmitted (OR = 2.708; p = .004). This attitudinal and awareness variable turned out to be different from the 2 variables that were statistically significant with perceived HIV risk in the bivariate analysis.

Chi-Square analysis of perceived HIV risk revealed strong statistical significance for 3 of 6 behavior variables. These were: regular religious service attendance, having multiple partners and condom use. As described earlier, regular attendance at religious services was used as a proxy for religiosity. Respondents who perceived HIV risk were less likely to attend religious services (x^2=24.219, n=1,253, df = 1, p = .000). This may be indicating that the issue may not be one's religious affiliation, but the degree to which one practices their religion. Other confounding factors may also influence the relationships between perceived HIV risk and the independent behavior variables.

Respondents who perceived HIV risk were 3 or more times more likely to report having multiple sexual partners (x^2=50.141, n=1,039, df = 1, p=.000) than those who reported none or little perception of risk. Of note was that a large majority of respondents reported being monogamous relationships in the three months prior to the survey. However, there was no way to determine whether a three-month monogamous

relationship was indicative of stable monogamous relationship, whether there was infidelity on the part of one or both partners, or any other possible explanation.

There was a statistical significance with condom use (x^2=24.219, n=1,253, df=1, p=.000). Respondents who perceived risk for HIV infection were more likely to use condoms than respondents who perceived little or no risk for HIV infection. Of major concern was the large percentage (60.4%) who reported they did not use condoms but felt they were at risk for HIV infection. If these respondents were among respondents who also reported having multiple sexual partners or engaged in other behaviors that increased their potential risk for HIV, then it should be a cause for concern to the public health officials in Belize.

None of the substance abuse variables came up as significant. This finding suggests a cause for some concern. Substance use is known to depress inhibition, increasing the likelihood that individuals will engage in risky behavior. The lack of significance may suggest that there was a lack of awareness or knowledge of how substance use affected prevention of HIV exposure.

The findings resulting from bivariate analyses for just those respondents who had multiple sexual partners were not very different from the significant associations of in the bivariate analysis of condom use or the bivariate analysis of having multiple sexual partners. A similar number of significant associations existed with biopsychosocial, attitudinal and behavioral characteristics.

A multivariate analysis was conducted to show whether the behavioral factors included in this study were independently associated with perceived HIV risk or whether they may have been interacting with each other or other confounding factors. The only behavioral variable that independently predicted perceived HIV risk was having multiple sexual partners. The odds were greater that respondents who perceived HIV risk also had multiple sexual partners (OR = 3.794; p = .000). The fact that condom use was not a predictor of perceived risk for HIV would support a conclusion that condoms were more likely to be used for pregnancy prevention than for HIV prevention.

Multiple Partners

Having multiple partners was not a dependent variable. However, it was a key finding for both dependent variables and, given it has been established in prior empirical research as a high risk behavior for HIV transmission, a multivariate analysis was conducted to assess independent predictors of having multiple partners. It was not known whether any predictive influences existed with other independent variables for this recognized risky behavior.

Chi-Square analysis resulted in 3 biopsychosocial variables that were significantly associated with having multiple partners. These included: age, ethnicity, and cohabitation status. Respondents with multiple partners were most likely among the youngest age group of 18-24 (x^2=32.440, n=1,117, df =4, p =.000). Although the percentage of respondents who reported having multiple partners was less than 10%, there were over 100 cases that were analyzed. The finding seemed to concur with findings for the overall sample. The findings also concurred with those findings established in studies done in other countries and cultures. Respondents were most

likely to report Black ethnicity and 4 times more likely to be single than cohabiting. Almost two-thirds (64.4%) of respondents with multiple partners reported being in cohabiting relationships. Unlike the findings from dependent variables condom use and perceived HIV risk, education level completed and religion were of no statistical significance in an analysis with having multiple partners included as a dependent variable.

Statistical significance no longer existed for at least 2 of the attitudinal and awareness variables in the bivariate analysis of condom use: non-stereotype opinion and high BMAI scores. With respect to the latter of these two, the BMAI was approaching statistical significance. Chi-Square analysis of having multiple partners resulted in 7 attitudinal and awareness variables that were significantly associated with having multiple partners. One factor of the BMAI was statistically significant with having multiple partners. Respondents with multiple partners were less likely to report an attitude of non-violence towards women (x^2=12.567, n=1,072, df=1, p=.000). Without further analysis and/or research, it is difficult to understand why non-violence attitudes would predict multiple partners. Possibly it is a proxy for positive attitudes toward women, which could extend to dating practices. Both variables relate to age, which could be one of several factors confounding the statistics. The fact that the BMAI was approaching significance (x^2=5.051, n=1,116, df=2, p=.080) would appear to support the finding above. Respondents with multiple partners were less likely to report a 'high' BMAI score.

Unlike the findings for both dependent variables, there were statistically significant relationships for 3 of the 5 measures of the HAI. Respondents with multiple sexual partners were more likely to report having knowledge of how HIV was transmitted (x^2=4.507, n=1,055, df=1, p=.034). They were also more likely to report having personal knowledge of someone who was seropositive for HIV (x^2=6.908, n=1,058, df=1, p=.009) or reported having an awareness leading to behavior change since learning about HIV(x^2=7.619, n=1,060, df=1, p=.006).

The overall HAI (x^2=5.672, n=1,117, df=2, p=.059) was also approaching statistical significance in the multiple partners bivariate analysis. While a majority of respondents had moderate HAI scores, monogamous respondents were most likely to report low HAI. Confounding factors could influence these relationships. For example, monogamous respondents reporting older age, lower condom use or no perceived risk for HIV infection, may mean that they were least likely to have knowledge about the HIV disease or how HIV was transmitted and how to avoid infection.

While the index was only approaching significance, it supported findings of the individual factors of the index. The greater likelihood of low scores on the HIV Awareness Index would suggest that work needed to be done by the public health officials in Belize to ensure a broader reach in health promotion and education related to increased awareness for HIV risk reduction. An important note to recall was that while 10% acknowledged the behavior of having multiple sexual partners, almost 20% did not respond at all. As discussed earlier, the under reporting on having multiple partners could produce potentially false findings in this bivariate analysis. Nonetheless it was possible that, for example, older age and cohabiting status contributed to a sense of safety that did not rely on having knowledge about HIV.

Respondents who had multiple partners were 2 or more times less likely to tell their HIV positive status (x^2=17.693, n=1,042, df=1, p=.000). This raised the concern, particularly with a large amount of missing data in the univariate analysis, of findings being spurious. The concern is especially valid when one considers the potential attitude if those missing data were indicative of respondents who had multiple partners and would not tell their status if they were HIV positive. It is a critical consideration for further research to ensure proper health promotion and education in HIV risk reduction.

Respondents in multiple sexual partnerships were more likely to believe condoms were efficient in preventing HIV (x^2=12.871, n=1,068, df=2, p=.002). One possible explanation for this finding may be that these respondents were condom users and felt they were safer even given the potentially risky behavior of having multiple sexual partners. This would be an encouraging finding to support the work of public health officials in promoting consistent and correct use of condoms for HIV risk reduction. Non condom users were earlier described as being less likely to know whether condoms were efficient in preventing HIV. Similarly, monogamous respondents were less likely to whether condoms were efficient in preventing HIV transmission. This trend also existed among respondents who did not perceive themselves at risk for HIV.

Respondents who reported having multiple partners were almost 3 times more likely to report perceived risk for HIV (x^2=50.141, n=1,039, df=1, p=.000). Of note was that a majority (66.4%) of respondents who reported having multiple partners did not believe they were at risk. This finding seemed to suggest that other factors made respondents believe they were not at risk. As discussed earlier, issues such as the risk behaviors of respondents' partners were not addressed in this survey and monogamy of partners could not be determined. Furthermore, monogamy was defined as a 3-month period and this time frame does not conform to the empirical HIV literature.

There was conformity to findings in empirical HIV research as well as conformity to the findings from bivariate analysis of attitudinal and awareness variables with having multiple partners. Each of the five behavioral variables was statistically significant in the bivariate analysis of having multiple partners. Respondents with multiple partners were less likely to attend religious services regularly (x^2=21.547, n=992, df=1, p=.000). The result was consistent with findings for both condom use and perceived HIV risk in earlier bivariate analyses. This finding bolsters support for the possibility that the practice of religion may be more important than which religion one belonged to.

There were statistically significant associations with all three substance use variables. Respondents who reported having multiple sexual partners were more likely to report binge drinking (x^2=15.544, n=1,023, df=1, p=.000) or heavy drinking (x^2=13.790, n=1.022, df=1, p=.000) or drug use (x^2=34.084, n=1,114, df=1, p=.000). Of note was that drug use was reported by a very small group of respondents, but respondents were more than 3 times as likely to have multiple partners as to be monogamous in the three months prior to the survey. This finding may therefore be spurious. If accurate, however, it was of important note because of established likelihood of engagement in one risky behavior predicting engagement in other risk behaviors.

Respondents with multiple partners were almost 3 times more likely to report condom use were (x^2=86.233, n=1,110, df=1, p=.000) as to report being monogamous in the three months prior to the survey. This finding supported previous discussion related to HIV awareness leading to change in behavior such as condom use. Of concern was the 41.5% who reported having multiple partners and did not use condoms. This highlights earlier discussions about an apparent discord between condom use and HIV infection. Further research is needed to better understand why individuals who are apparently engaging in risky behaviors would not be using condoms.

When the variables were entered into a multivariate analysis, none of the 3 biopsychosocial factors were predictors for having multiple partners. Only 2 of 7 attitudinal and awareness factors were independently predicting having multiple partners. These were non-stereotype opinion (OR = 0.457; p = .017) and perceived HIV risk (OR = 4.024; p = .000). The former had negative predictive relationships, indicating that the odds were lower respondents with multiple partners would have an egalitarian attitude towards women. The finding for the second attitudinal variable resulted in a strong positive predictive relationship, indicating the odds were greater that respondents with multiple partners perceived risk for HIV infection.

Of note was that one of these variables, non-stereotype opinion, did not have a statistically significant association with multiple partners in the bivariate analysis. Only one behavioral factor was predictive of multiple partnerships: condom use. The relationship was a strong positive one where odds were greater that respondents with multiple partners used condom use (OR 3.632; p = .000).

CHAPTER VI: CONCLUSIONS

Introduction

Less than 1% of persons worldwide are believed to be HIV positive. The Caribbean region has the highest regional adult HIV prevalence second only to sub-Saharan Africa (UNAIDS, 2007) with an average 5% prevalence in the adult population. Since Belize's first diagnosed seropositive case in 1986, the increase has been significant, with more than 2% prevalence in the adult population at the 2005 year end (UNAIDS, 2007).

Although heterosexual contact was the primary mode of HIV transmission in Caribbean and Latin American countries, sex between men is a recognized factor in the heterosexual transmission (Cohen, 2006; Fraser, 2004). Given the history of the HIV/AIDS epidemic and the shift in the spread from a homosexual to the heterosexual population, the heterosexual adult male has been a neglected segment of the population that is at risk for HIV infection. The absence of a heterosexual male focus in AIDS education and/or participation in counseling, testing and safer sexual practices has been noticed.

The study of heterosexual Belizean males was of demographic, behavioral and attitudinal variables that contributed to sexual risk behaviors associated with HIV/AIDS. The research question focused on relationships between several bio-psychosocial variables and condom use, perceived HIV risk, and multiple partners. Specific attention was given to the relationship between perception of HIV risk and condom use. Measures of benevolent machismo attitude, as constructs of gender and power theory, were included. Aspects of the Health Belief Model also supported the analysis of predictor variables.

Methodology

The study population was men between the ages of 18 to 64, resident in Belize and reporting heterosexual behavior, who participated in the national 1999 Family Health Survey. The study design was a quantitative, secondary data analysis of a Belizean dataset with 25 variables, 23 of which were independent. The variables were grouped into three categories. The first was of bio-psychosocial variables that were classified as predisposing variables. The second category was of variables that were indicative of knowledge, attitudes and beliefs, and the third was a group of behavior variables. Two variables were index measures of benevolent machismo attitude and HIV awareness. Factor analysis confirmed the fit for both machismo attitude and HIV/AIDS awareness indexes. These, however, were not validated. There were several other composite variables.

A number of relationships between condom use and biopsychosocial, attitudinal and behavioral variables were hypothesized in the study. A number of relationships between respondents' perception of HIV risk and the independent variables were also

hypothesized. Descriptive analyses provided preliminary results for independent variables statistically significant with condom use and statistically significant with perceived risk for HIV/AIDS. Inferential analyses were conducted for both dependent variables to determine predictors of condom use and perceived HIV risk. The relevance of these, to each hypothesis, was discussed.

Having multiple partners was not a dependent variable. However, it was a key finding for both dependent variables. Since it was established in prior empirical research as a high risk behavior for HIV transmission, a multivariate analysis was done to assess independent predictors of having multiple partners.

Findings

The typical heterosexual male living in Belize in 1999 was Catholic, Mestizo, over 35 years of age, had completed primary school, was in a cohabiting relationship and had not been abused in his home during his childhood years. While the ethnic distribution in the sample closely approximated the general population, the median age group in the sample was significantly higher than that of the 1999 general male population.

The 70% moderate to high ratings on the BMAI scale meant that overall respondents had an egalitarian, non-violent, non-stereotypical perspective of women. The 70% moderate to high ratings on HAI scale also meant there was overall knowledge about HIV disease, how to prevent transmission or avoid infection. Other awareness and attitudinal findings indicated respondents did not perceive themselves to be at risk for HIV infection and had every intention of sharing their status with their partners if they were seropositve. A majority, however, did not believe or know if condoms were efficient in preventing HIV.

Respondents were most likely to describe binge drinking patterns (35.9%). A small but substantial percentage (9.5%) reported having multiple partners. One major finding was that less than one quarter of the respondents in this sample were using condoms at the time of the survey. Such a finding would suggest that the group of respondents in this study was not necessarily the best sample to determine predictive factors of condom use.

Condom Use

Bivariate analyses of condom use showed significant associations at the p=.000 level for several biopsychosocial variables. There were strong (2 or more times likely) relationships with younger age, Black ethnicity, post primary education completed, and non-cohabiting relationship status. It was hypothesized that the Catholics would be less likely to use condoms because of the religious sanctions against contraceptive use. However, Catholics were just as likely to report condom use as non-Catholics. The lack of a statistically significant association was, therefore, an unexpected finding between condom use and religion.

One of the premises of the study was that a relationship existed between condom use and benevolent machismo. This variable was constructed to determine

attitudes about and awareness of HIV and reported as an index. Only one factor in the Benevolent Machismo Attitude Index, which was evenly distributed between yes and no responses, resulted in a significant relationship in the condom use bivariate analysis. Respondents who had similar opinions of the sexual and reproductive roles and responsibilities for both men and women were defined as having non-stereotypical opinions about women. Condom users were more likely to report this opinion. Condom users were also more likely to have a high BMAI score. They were not, however, likely to have a high HIV Awareness Index (HAI) score.

Two of the 5 factors in the HAI were statistically significant. Respondents who indicated 3 or more accepted modes of HIV transmission were considered to have knowledge of HIV transmission. Respondents who reported making 1 or more behavior changes since learning about HIV were considered to have awareness leading to behavior change. Condom users were more likely to report having knowledge of HIV transmission and awareness leading to behavior change. Condom users were also more likely to indicate they believed condoms were efficient in preventing HIV transmission, more likely to perceive themselves at some or high risk for HIV infection, but less likely to report that they intended to tell their partners(s) their HIV status if they were HIV+. These were three other attitudinal and awareness variables that had statistical significance with condom use.

There was less likelihood condom users would report at least one of 5 behavior variables that had statistical significance. Respondents were less likely to attend religious services 12 or more times per year. Condom users were more likely, however, to report having multiple partners, binge drinking, heavy drinking and drug use. While these and previously discussed findings of the bivariate analysis for condom use supported most study hypotheses, the findings also raised the consideration that further analysis was needed for a better understanding of these findings.

A multivariate analysis of condom showed little difference from the bivariate analysis findings. Of note was that education was no longer statistically significant and the clear association between Black ethnicity and condom use was not longer applicable. The multivariate analysis found that the odds were lower that condom users were Mestizo or Maya. Black ethnicity, however, was not a predictor of condom use.

No factor included in the Benevolent Machismo Attitude Index, nor the index itself was statistically significant. This finding was different from the bivariate analysis of condom use where 1 of 3 BMAI factors and the BAMI itself were statistically significant. Furthermore, there were no statistically significant relationships for the HIV Awareness Index or any of its 5 factors that predicted condom use. The only other attitudinal and awareness variable that was predictive of condom use was belief that condoms were efficient in preventing HIV transmission. These findings would suggest that most associations of attitudinal and awareness variables were not independent, but interacting with each other or other confounding variables.

The suggestion of interactions among variables was further supported in the multivariate analysis of behavioral variables. While all behavioral variables were statistically significant in bivariate analysis, only 2 were predictive of condom use. These were having multiple sexual partners and binge drinking.

Perceived HIV Risk

Bivariate analyses of perceived HIV risk showed significant associations at the p=.000 level for similar biopsychosocial variables as found in the bivariate analysis of condom use. There were positive relationships with younger age, Black ethnicity, Catholic religion, and non-cohabiting relationship status. Post primary education completed was not statistically significant for perceived HIV risk. It was hypothesized that there was a relationship between Catholic religion and perceived HIV risk. This hypothesis was supported by the bivariate finding. However, Catholic religion was not a predictor of perceived HIV risk. None of the other significant associations in the bivariate analysis were predicting perceived HIV risk, indicating that the associations were not independent of each other.

Only one attitudinal and awareness variable, having HIV transmission knowledge, was predictive of perceived HIV risk. This variable was positively predictive, indicating greater odds that respondents who perceived them selves at some or great risk also had knowledge of how HIV was transmitted. Of note was that the variable that was predictive of perceived HIV risk was not among the 2 attitudinal and awareness variables that were significantly associated with perceived HIV risk in the bivariate analysis.

Findings from the bivariate analysis showed that respondents were more likely to have awareness leading to behavior change since learning about HIV. Respondents who perceived risk for HIV infection were less likely to tell their partners of their HIV status if they were HIV+. While these were among the attitudinal and awareness variables that also had statistical significance in the condom use bivariate analysis, there were 3 or more times as many attitudinal variables that were significantly associated with condom use.

In the bivariate analysis there were twice as many behavioral variables associated with condom use as there were for the perceived HIV risk. However, both behavioral variables that were significantly associated in the perceived HIV risk analysis were also significantly associated in the condom use analysis. Two behavioral factors predicted perceived HIV risk. The odds were greater that respondents who perceived HIV risk had knowledge of how HIV was transmitted. The odds were also greater that respondents who perceived HIV risk had more than one sexual partner in the three months leading up to the survey.

Study Limitations

The data was not collected specifically for the current research question. This meant that the primary purpose of the data collection was one limitation of the study. It was, however, feasible to work with the dataset after careful examination confirmed that the primary dataset included the data needed to address the research question. A data dictionary of coding was not available but the data was adequately defined to allow the desired analysis.

Given that the primary data was collected in 1999, on the surface of it, the primary data would appear to be old. As the most recent data of its kind, however, this baseline data provided an appropriate snapshot to facilitate reflection on responses. It

also provided a social context that can inform trend analysis of social context of a sample 10 years later, for example.

The secondary data analysis required operationalizing several independent measures. For example, regular attendance at church was a proxy measure for religiosity. This measure may not have been comprehensive enough to measure this variable, but it was the only data available within the study. A similar problem occurred in the development of the Benevolent Machismo Index. Theory points to several variables associated with machismo. Five factors were used as proxies for this index but may not have been the most accurate way to measure the variable. Had the primary research been designed with this variable specifically included, the findings may have been different. However, measures were constructed with arbitrary cut-offs and, though logically and theoretically informed, were not validated.

Another concern that evolved from the primary dataset was a fairly high number of missing data on key variables. For example, almost 16% of the respondents did not respond to the question on cohabitation. If this non-response was indicative of 'single' habitation status, then over 26% of respondents would be 'single', rather than the reported 10.8%. The size of the non-response category for this particular variable could affect the confidence of the findings, potentially leading to an under-reporting of respondents who were single. Any bivariate or multivariate analysis could be spurious because of the large amount of missing data.

The data may have been affected by issues such as respondents' understanding of specific survey questions. Some questions had ambiguous descriptors that made them open to broad subjective interpretation by individual interviewers and or interviewees. This was most evident in several questions that asked about beliefs and opinions. While these questions were not included in the dissertation research, their presence raised the concern that other questions could have been similarly affected.

Bias may have been a limitation of this study. There may have been bias in the primary data planning, collection and analysis that were not known in the secondary data analysis process. This dissertation author did not participate in the planning and execution of the primary data collection process and so, did not know exactly how it was done. Communication between the secondary data researcher and the primary researchers was done to elaborate on areas that were unclear.

In spite of the use of a probability sampling strategy, generalization of these findings for the entire male population in Belize would not be recommended given that the sample in this study may not be representative of the population, at least according to age. It must be noted that the original study from which this data was drawn was heavily geared towards reproductive health rather than STIs, although there were questions specifically geared towards HIV. The orientation of the study may have influenced response patterns towards pregnancy prevention rather than STI prevention.

This interpretation about pregnancy prevention was also supported by the large majority of respondents that were in monogamous relationships. No question addressed whether or not the males had any definitive measure of HIV status or status of the partner, such as a blood test. The primary survey did not address the risk factors of the partner in the heterosexual relationship. There was no way to determine whether or not the "partner" was being monogamous. This made it more difficult to interpret whether or not the respondents were answering with factual knowledge of HIV status or only

their perception of safety. The low perception of HIV risk and use of condoms may have been based on a false sense of safety.

There may have been bias in the respondent selection given that respondents self selected to be a part of the study. The primary research was done in respondents' homes with interviewers who were strangers, expecting respondents to share personal, private and sensitive matters about the sexual lives and substance use that may be considered criminal. The level of confidentiality that was available in the interview site may not have provided the most optimal environment for interviewing. Respondents may have under- or over-reported to compensate. Relationships were only examined through a window of the past three months. HIV exposure could have occurred in risky behaviors prior to this three month period and not show any signs of infection. Respondents could have been less than truthful in their responses to these sensitive questions. Respondents may have provided what they perceive to be "politically correct" responses when answering sensitive questions using a face-to-face data collection method.

Policy Implication

Condoms, used consistently and correctly, have been promoted as the safest practice for those involved in sexual activity (Collumbein et al., 2001; Goodkind & Ahn, 1997). Research has established that risk for HIV is influenced by individual behaviors. This epidemiologic research of the HIV/AIDS epidemic in Belize utilized both Gender Power Theory and Health Belief Model to explain behaviors and identify potential prevention directions.

Over three-fourths of the respondents reported they were not using condoms at the time of the survey. This finding of limited use of condoms was cause for concern. Decrease in condom use is affected by the sexual 'safeness' of the woman as perceived by the heterosexual male (Payn et al., 1997; Santelli et al., 1998).

Once a relationship stabilizes, sex without condoms often becomes the practice (Pleck, Sonenstein & Ku, 1993; Smith, 2004). The high percentage of monogamous relationships and their perceptions of low risk may account for less than 1/4 of the respondents using condom at the time of the survey, but monogamy would not eliminate the risk for HIV exposure.

The data only addressed sexual contact within the past 3 months. Exposure to HIV/AIDS could have occurred prior to the monogamous relationship. There was no way, from the data in this study, to determine how long the respondent was monogamous, nor was there any objective measure of HIV status (i.e., blood tests) to validate the participant's real level of safety in sexual contact.

Male condom use is under their direct control given that men physically wear the condoms. A strong male dislike for condom use is often enhanced by women's expressed reluctance for their male partners to use condoms. Reluctance often stems from women's fear that their male partners would leave them or that their male partners would believe the women them selves were being unfaithful. This reluctance augments the temporal positioning of condoms in many relationships and constitutes a barrier to consistent and correct use of condoms as the safer sex practice in the prevention of HIV/AIDS. Fear of labeling and subsequent rejection can negatively influence condom

use when the individual, who uses condoms, is viewed as being HIV positive. The social construction of masculinity, defined as machismo in the Caribbean and Latin America, influenced behaviors such as condom use.

Condom use has been a key part in the comprehensive HIV prevention strategies in Belize. Condom use plays two vital roles. One major role is the male controlled method of contraception. The second role is that of prevention of transmission of HIV and other sexually transmitted infections. It is most important to increase consistent and correct use of condoms among men at different times in their lives and for purposes other than pregnancy prevention. Policy initiatives are needed to increase access to condoms, such as creating distribution sites in schools and other public facilities. Free access to condoms may need to be supported in low-incomes areas where health prevention is less likely to be a priority for its residents.

It is important to ascertain that HIV prevention programs that include condom promotion be made available to everyone. Respondents in this survey, who were not, by their self report, those most at risk for HIV (87% had only one sexual partner), but they too need to have the prevention program available. They need to be targeted to assure increased awareness about HIV given the changes in life's circumstances at different times in the life cycle of men.

A major issue before public health officials is how to enhance the perception of HIV risk among Belizean males and how to link this to condom use as the primary strategy for risk reduction. Lack of knowledge and understanding about HIV/AIDS could lead to misconceptions about possible HIV risk. The findings on both perceived risk and condom use suggested further attention may be needed in how the health promotion and health education agendas are structured and the differential impact these may have on subgroups within the Belizean male population. While there is a need for differential educational campaign products that target the educational needs of specific populations such as heterosexual males. A major focus on the reproductive health program would be gender equity. There should be an enhanced heterosexual male focus targeting gender equitable HIV prevention towards men at different times in their life cycles. There should also be a focus on an expansion of evidenced based health promotion and health education targeting multiple subgroups with the Belizean male population.

In order to generate more information on specific population groups such as, heterosexual male at different times in their life cycle, the Belizean government should infuse more funding to expand research on the efficacy of public health interventions. Furthermore, specific attention should be directed towards the expansion of resources to identify alternative research methodologies that would increase data collection accuracy on sensitive topics such as HIV. For example, a "political correctness" factor could have influenced responses on specific HIV/AIDS awareness and knowledge such as respondents' willingness to share their HIV positive status with their partners.

Public health laws encourage and often mandate the sharing of this type of information. Therefore, a positive response to this question may have more to do with what respondents believed they should answer. This potential impact could be highlighted in the public health communicable diseases contact tracing planning and systems. Belize has a generalized epidemic. It means everyone needs to be reached to be sure a comprehensive combined strategy accommodates a myriad of needs.

Research support, in the form of research grants from the government, is needed to examine alternative research methodologies that are likely to increase honest and accurate data collection on sensitive issues, particularly with awareness to the culture and norms within Belize.

Future Directions

Belize has begun to conduct much needed baseline studies among vulnerable and high risk groups. Such population based studies need to continue to inform measurable intervention programs and provide currency of accurate data for national and international utilization. There is a need for further research using methodology that would increase the likelihood of frank and sincere answers for these sensitive issues. For example, the primary research had been done in a wholly anonymous manner (e.g., mailed questionnaires or computer-generated questionnaires). This would be particularly relevant for the specifically sensitive questions and could thoroughly assure respondents so that they could answer candidly without risk of exposure or judgment. If only sections of the survey were anonymously responded to, these sensitive questions could use a personal identification number to connect the specific section to the remainder of the survey. A follow-up to the Male Family Health Survey could consider data collection techniques that would more successfully seek to provide more complete and accurate data.

A low perception of risk appeared to influence condom use behavior. The use of condoms may be driven by different reasons, such as pregnancy prevention. Clearly, more data would be needed to understand motivation to not use condom. There is a need to conduct a serious review the of condom promotion campaign strategies to determine (1) if the 23% of reported condom use was an accurate reflection among heterosexual men; (2) in what age groups and which intimate partner relationships; and (3) what the primary purpose for condom use was.

Subjective belief is a critical component of HIV risk perception. The potential for a false sense of security appeared to be possible, based on the interpretation of findings in this study. Respondents engaged in high risk behaviors perceived no risk for HIV infection. It was not possible in the study data to examine the issue of health promotion and health education as it related to perceived HIV risk and condom use. There is need for more research to further explore the apparent lack of connection between perceived HIV risk and condom use. It would also be helpful to any health promotion campaign being mounted to first determine how risk is defined and what kinds of behaviors are considered risky by men at different times in their lives and under what circumstances.

The data showed that almost one third of the respondents did not attend any formal schooling. Large segments of the population, such as those in this study who were 35 years of age or older, would miss HIV/AIDS education opportunities if they were offered in the formal school setting alone or through written health education materials used in mass media campaigns and health materials available in health care sites. Therefore, HIV awareness cannot be limited to the formal school setting and cannot be limited to one age group. Different age groups have different views and

needs at different times in their lives. These are considerations for the conduct of health promotion and education campaigns to prevent HIV.

As discussed earlier, the Benevolent Machismo Index was developed with 5 factors to attempt an understanding of the influence of machismo on heterosexual male respondents in Belize. The data did not allow collection tool was not design to measure the variable for machismo to be defined, hence proxies were used. A bivariate analysis with condom use found statistical significance for non-stereotypical opinions about women. All other factors within the index and the index itself were non-significant for condom use. It was difficult to determine the meaning from the data. However, this would be an area for future research to explore in more depth the significance of males' non-stereotypical opinions of women on risk behaviors for sexually transmitted infections. It would be important to determine how other machismo is defined in Belize, and if one definition is applied throughout the different times in men's life cycles.

The perceived safety of a monogamous relationship is dependent on no previous exposure and no engagement in extramarital affairs during the relationship. No national data on extra marital affairs in Belize could be found. However, if 50% rates reported in the United States were true, different sub-groups in Belize have no way of knowing if their partners were exposed prior to or during their relationships. Data collection in this area would be helpful to paint an accurate picture of the impact of extra marital affairs in Belize.

Nothing in this survey looked at the risk factors of the partner in the heterosexual relationship. There was no way to determine whether or not the "partner" was being monogamous. One direction for future research would be to focus on both individuals in the monogamous heterosexual couples to determine specific types of potentially risky sexual partnerships such as serial monogamy, concurrent partnerships, polygamy, episodic (1-night stand), paid sex, or extra-dyadic partnerships.

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APPENDIX A

VARIABLE MEASUREMENTS

No.	Variable	Definition	Measurement
Dependent			
Condom Use		- yes or no	yes (1) if q905 = 1 else no (0) ≠ 9
HIV Risk Perception		- some/great - none/little	Some/great (1) if q803 = 1 or 2 None/little (0) if q803 = 3 or 4
Independent			
1	Age	- 18-24 - 25-34 - 35-44 - 45-54 - 55+	q101 continuous age ranging from 18 to 69 years
2	Childhood Abuse	- yes or no	yes (1) if q1320 = 1 no (0) if q1320 = 2
3	Education	- primary - post primary - none	primary(0) if q111 < 9 > 2 post primary (1) if q111 = 2 none (2) if = 1
4	Ethnicity	- Black - Mestizo - Maya - Other	Black (1) if q103 =1 or 4 or 6 Mestizo (2) if q103 =10 or 12 Maya (3) if q103 = 7 or 8 or 11 else Other (4) if ≠ 99
5	Habitation Status	- Cohabiting or not	Not cohabiting (1) if q601 ≤2 cohabiting (0) if q601 <9>2
6	Religion	- Catholic - Other - None	None (3) if q104 = 15 Catholic(1) if q104 = 12 else Other (0) if ≠ 99
7	Mutual decision making	- yes or no	yes (1) if [q1121=3 and q1124=3 and q1125 =3] else no (0) if q1121 or q1124 or q1125 ≠ 9
8	Non-stereotype Opinion	- yes or no same opinion	yes (1) if [same opinion=1 and same age=1 and same treatment =1] else no (0) yes (1) if [q1206=2 and q1212=2 and q1215=2 and q1216=2] else no (0) if q1206≠ 9 or q1212≠ 9 or q1215≠ 9 or q1216 ≠ 9

No.	Variable	Definition	Measurement
		same age	yes (1) if q1108 = q1109 ≠ 99 else no (0)if q1108 or q1109 ≠ 99
		same treatment	yes (1) if q1213 =1 and q1214 =2 else no (0) if q1213 ≠ 99 or q1214 ≠ 99
9	Non-violence to women	- yes or no	yes (1) if [q1324(1)=2 and q1324(2)=2 and q1324(3)=2 and q1324(4)=2 and q1324(5)=2 and q1324(6)=2 and q1324(7)=2] else no (0) if q1324(1) ≠ 9 or q1324(2) ≠ 9 or q1324(3) ≠ 9 or q1324(4) ≠ 9 or q1324(5) ≠ 9 or q1324(6) ≠ 9 or q1324(7) ≠ 9
10	Benevolent Machismo Attitude Index	Score range - high - moderate - low	SUM(mutual decision making, non-stereotype opinion, and non-violence to women) high (1) if SUM >2 moderate if SUM >1≤2 low (0) if SUM ≤1
11	HIV transmission knowledge	- yes or no	yes (1) if SUM [q802(4)=1, q802(5)=1, q802(6)=1, q802(7)=1, q802(8)=1, q802(9)=1, q802(11)=1, q802(12)=1, q802(13)=1, q802(14)=1] ≥ 3 no (0) if SUM [q802(4)=1, q802(5)=1, q802(6)=1, q802(7)=1, q802(8)=1, q802(9)=1, q802(11)=1, q802(12)=1, q802(13)=1, q802(14)=1] < 3
12	Avoid HIV infection knowledge	- yes or no	yes (1) if SUM [q806(1)=1,q806(2)=1, q806(3)=1, q806(4)=1, q806(5)=1, q806(6)=1, q806(7)=1, q806(8)=1, q806(9)=1, q806(10)=1, q806(11)=1] ≥ 3 else no (0) if SUM [q806(1)=1,q806(2)=1, q806(3)=1, q806(4)=1, q806(5)=1, q806(6)=1, q806(7)=1, q806(8)=1, q806(9)=1, q806(10)=1, q806(11)=1] < 3
13	Personal	- yes or no	yes (1) if q813=1

No.	Variable	Definition	Measurement
	knowledge		no (0) if q813=2
14	Factual knowledge	- yes or no	yes (1) if [q809=1 and q812=2] else no (0) if q809 or q812 ≠9
15	Awareness leading to behavior change	- yes or no	yes (1) if [q808(1)=1] or [q808(2)=1] or [q808(7)=1] or [q808(8)=1] else no (0) if q808(1) or q808(2) or q808(3) or q808(4) or q808(5) or q808(6) or q808(7) or q808(8) ≠ 9
16	HIV/AIDS Awareness Index	Score range - high - moderate - low	SUM(HIV transmission knowledge, avoid HIV infection knowledge, behavior change, personal knowledge, factual knowledge) high (1) if SUM ≥3.6 moderate if SUM ≥1.6≤3.5 low (0) if SUM ≤1.5
17	Tell HIV+ Status	- yes or no	yes (1) if q810=1 no (0) if q810=2
18	Condom Efficient	- yes or no or don't know	dn't know (9) if q814=9 yes (1) if q814=1 or 2 else no (0)
19	Regular Attendance	- yes or no	yes (1) if q105 ≤ 2 no (0) if q105 <9>2
20	Multiple Partners	- yes or no	yes (1) = q718 = >1≤78 no (0) if q718 = ≤1
21	Binge drink	- yes or no	yes (1) if q1304 <99≥5 else no (0) if q1304 ≠ 99
22	Heavy Drink	- yes or no	yes (1) if [q1303 ≤ 2 and q1304 <99≥5] else no (0) if q1303≠ 9 or q1304 ≠99
23	Drug use	- yes or no	yes (1) if q1311=1 or q1314=1 or q1317=1 else no (0) if q1311 ≠ 9 or q1314≠ 9 or q1317≠ 9

APPENDIX B

QUESTIONS USED FROM SURVEY INSTRUMENT

No.	Variable	Question and Response options
Dependent Variables		
1	Condom Use	q905 Are you presently using condoms with any female? 01 Yes 02 No (SKIP TO Q918) 09 DK/NS
2	HIV Risk Perception	q803 What risk do you think there is of you getting HIV/AIDS? 01 A great risk (SKIP TO Q805) 04 No risk at all 02 Some risk (SKIP TO Q805) 09 Don't know/Not Stated 03 Not much risk (SKIP TO Q806)
Independent Variables		
1	Age	q101 How old are you presently? ___ years 99 Don't know/Not Stated
2	Childhood Abuse	q1320 Have you ever been abused as a child in your home, either physically, emotionally or sexually? 01 Yes 02 No (SKIP TO Q1324) 09 DK/NS
3	Education	q111 What is the highest school level you have completed? 01 None 05 Sixth Form or Equivalent 02 Primary 06 University 03 High School 09 Don't know/Not Stated 04 BTTC/BCA/BNS
4	Ethnicity	q103 To which ethnic group do you belong? 01 Black/African 08 Maya Mopan 02 Caucasian/White 09 Mennonite 03 Chinese 10 Mestizo 04 Creole 11 Yucatan Maya 05 East Indian 12 Spanish 06 Garifuna 88 Other (specify) ____ 07 Maya Ketchi 99 Don't know/Not Stated
5	Habitation	q601 What is your current union status?

No.	Variable	Question and Response options
	Status	01 Legally married and living with spouse 02 Common-law union 03 Visiting sexual relationship 04 Legally married but not in union 05 Legally separated but not in union 06 Widowed and not in union 07 Divorced and not in union 08 Not in union 09 Don't know/Not Stated
6	Religion	q104 What is your religion/denomination? 01 Anglican 10 Nazarene 02 Bahai Faith 11 Pentecostal 03 Baptist 12 Roman Catholic 04 Hindu 13 Salvation Army 05 Jehovah Witness 14 Seventh Day 06 Mennonite Adventist 07 Methodist 15 None (SKIP TO 106) 08 Mormon 88 Other (specify) ___ 09 Muslim 99 Don't know/Not Stated (Skip to 106)
7	Mutual decision making	q1121 Who do you think should decide how many children a couple should have? 01 The woman 06 Religious leader 02 The man 07 Fate, up to God 03 Both partners 08 Other (Specify _____) 04 Mother-in-law 09 Don't know/Not Stated 05 Nurse/doctor/mid-wife q1124 Who do you think should decide whether a couple should use contraception? 01 The woman 06 Religious leader 02 The man 07 Fate, up to God 03 Both partners 08 Other (Specify _____) 04 Mother-in-law 09 Don't know/Not Stated 05 Nurse/doctor/mid-wife q1125 Who should decide on what type of contraceptive a couple should use? 01 The woman 06 Religious leader 02 The man 07 Fate, up to God 03 Both partners 08 Other (Specify _____) 04 Mother-in-law 09 Don't know/Not Stated 05 Nurse/doctor/mid-wife
8	Non-	Same opinion 1 Yes 0 No

No.	Variable	Question and Response options
	stereotype Opinion	Same age 1 Yes 0 No Same treatment 1 Yes 0 No
8.1	Same Opinion	q1206 There is something wrong with a boy who has not had sex by the time he is 16. 01 True 02 Untrue 09 DK/NS q1212 It is important for a woman to be a virgin when she marries 01 True 02 Untrue 09 DK/NS q1215 Boys should go to prostitutes to become men 01 True 02 Untrue 09 DK/NS q1216 It is okay for married men to have extra-marital affairs 01 True 02 Untrue 09 DK/NS
8.2	Same Age	q1108 How old do you think a woman should be before she has sex for the first time? ___ years 99 Don't know/Not Stated q1109 How old do you think a man should be before he has sex for the first time? ___ years 99 Don't know/Not Stated
8.3	Same treatment	q1213 A pregnant school girl should be allowed to return to school after she has baby. 01 True 02 Untrue 09 DK/NS q1214 A school boy who gets a girl pregnant should be expelled from school 01 True 02 Untrue 09 DK/NS
9	Non-violence towards women	q1324 Under what circumstances do you think it is okay to beat a woman? [READ] 01 Agree 02 Not Agree 09 DK/NS (01) When food is not served on time (02) When you are tired (03) When she is getting on your nerves (04) When she has an affair (05) When she yells at you (06) When she doesn't want to have sex (07) When the kids are too noisy
10	Benevolent	Mutual decision making 1 Yes 0 No

No.	Variable	Question and Response options
	Machismo Attitude Index	Non-stereotype Opinion 1 Yes 0 No Non-violence towards women 1 Yes 0 No
11	HIV/AIDS transmission knowledge	q802 In what ways do you think a person can get the HIV/AIDS virus? [Prompt but do not read.] 01 Yes 02 No 09 DK/NS (01) Shaking hands (02) Being in the same room with a person who has the HIV/AIDS virus (03) Sharing personal items like dishes, toilets, etc (04) Sharing needles used for drugs (05) Sexual intercourse between men (06) Sexual intercourse between women (07) Sexual intercourse between a man and a woman (08) Giving a blood donation (09) Receiving a blood transfusion (10) Being bitten by an insect that has bitten someone with the AIDS virus (11) Kissing, love bites/hickies/vamps (12) Oral sex (13) Tattoo/acupuncture (14) Mother to child/Breastfeeding (15) Sharing shaving units (16) Sharing dental instruments/devices (88) Other (specify _____)
12	Avoid HIV Infection Knowledge	q806. How can anyone avoid getting HIV/AIDS. [NOTE TO INTERVIEWER: Do not read but circle as many as necessary] 01 Yes 02 No (01) Be monogamous/Have only one sex partner (02) Reduce number of partners (03) Abstinence (04) Don't have oral sex (05) Don't have anal sex (06) Don't have sex with homosexuals (07) Don't have sex with strangers (08) Don't have sex with prostitutes (09) Don't share needles for drugs/tattoos/acupuncture (10) Don't have unsafe blood transfusion (11) Use condoms

No.	Variable	Question and Response options
13	Behavior change awareness	q807 Have you in any way modified your behavior since you first heard of HIV/AIDS? 01 Yes 02 No (Skip to q809) 09 DK/NS (Skip to q809) q808 In what ways? [READ] 01 Yes 02 No (01) Abstinence (02) Condoms (03) Diaphragm (04) Spermicidal Jelly (05) Foam or cream (06) Sex without penetration (07) Reduction in number of partners (08) Monogamy/fidelity. (88) Other (specify _____)
14	Personal knowledge	q813 Do you personally know anyone who has HIV/AIDS or has died from AIDS? 01 Yes 02 No 09 DK/NS
15	Factual knowledge	q809 Can a person be infected with the AIDS virus and not show symptoms? 01 Yes 02 No 09 DK/NS q812 Is there a cure for AIDS? 01 Yes 02 No 09 DK/NS
16	HIV Awareness Index	HIV/AIDS transmission knowledge 1 Yes 0 No Avoid HIV/AIDS infection knowledge 1 Yes 0 No Behavior change Awareness 1 Yes 0 No Personal knowledge 1 Yes 0 No Factual knowledge 1 Yes 0 No
17	HIV+ Status	q810 Suppose you had the AIDS virus, would you tell your partner or partners? 01 Yes (Skip to q812) 02 No 09 DK/NS
18	Condom Efficient	q814 How efficient do you think condoms are in preventing the transmission of AIDS? [READ] 01 Very efficient 04 Inefficient 02 Efficient 08 Other (specify) _____ 03 Not very efficient 09 Don't know/Not Stated

No.	Variable	Question and Response options
19	Regular service attendance	q105 With what frequency do you attend religious services? 01 At least once a week 04 Special occasions only 02 At least once a month (weddings, etc.) 03 Less than once a month 05 Doesn't attend at all 09 Don't know/Not Stated
20	Multiple Partners	q718 With how many females have you had sexual intercourse in the last 3 months? _____ 77 Don't remember – less than 10 79 Don't remember 78 Don't remember – more than 10 99 Don't know/Not Stated
21	Binge Drinking	q1302 Do you still consume alcoholic beverages? 01 Yes 02 No (Skip to q1305) 09 DK/NS q1304 On average how many drinks do you consume on each occasion? __ __ alcoholic beverages 99 DK/NS
22	Heavy Drinking	q1302 Do you still consume alcoholic beverages? 01 Yes 02 No (Skip to q1305) 09 DK/NS q1303 How often do you consume alcoholic beverages? 01 Daily 04 Special occasions only 02 On weekends only 08 Other (specify) _____ 03 Once a month 09 DK/NS q1304 On average how many drinks do you consume on each occasion? __ alcoholic beverages 99 DK/NS
23	Drug Use	q1311 Do you still smoke marijuana? 01 Yes 02 No 09 DK/NS q1314 Do you still smoke crack cocaine or sniff cocaine? 01 Yes 02 No 09 DK/NS q1317 Do you still use heroin? 01 Yes 02 No 09 DK/NS

APPENDIX C

LIST OF ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
BMAI	Benevolent Machismo Attitude Index
CARICOM	Caribbean Community
CDC	Center for Disease Control
CORIHS	Committees on Research Involving Human Subjects
CSO	Central Statistics Office
DK/NS	Don't Know/Not Sure
GPT	Gender Power Theory
HAI	HIV/AIDS Awareness Index
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
KAP	Knowledge, Attitude and Practice
MOH	Ministry of Health
MSM	Men who have Sex with Men
NAC	National AIDS Commission
NATF	National AIDS Task Force
OR	Odds Ratio
PANCAP	Pan Caribbean Partnership Against HIV/AIDS
SIB	Statistical Institute of Belize (formerly CSO)
SPSS	Statistical Package for Social Sciences
SRPS	Sexual Relationship Power Scale
STI	Sexually Transmitted Infections
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembly Special Session
UNIFEM	United Nations Development Fund for Women
USAID	United States Agency for International Development